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THE SURGERY OF THE URETERS: A CLINICAL, LITERARY AND EXPERIMENTAL RESEARCH.

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Introduction.—The desirability of more readily applicable and more complete methods of dealing with the surgical conditions met with in connection with the excretory ducts of the kidneys is patent to every one who has given even the most cursory attention to the subject. The variety of "surgical" conditions brought about by accidents and diseases of the ureters is sufficiently large, and the number of cases met with is great enough to make the subject one of practical interest to every surgeon. The most obvious of these conditions, injury to the ureter by the penetration of a foreign body, as noted in the remarkable and historic case of the Archbishop of Paris in 1848, is nevertheless least frequent of occurrence.[31] The practical surgeon is daily confronted with the horror of obstructing, rupturing, crushing or cutting a ureter in the course of some abdominal or pelvic operation.

Much has already been done in this field of ureteral surgery; and it would be farthest from the present desire to detract from the illustrious efforts of those who like Tuffier, Pozzi, Rydygier, and Kuester following the pathfinding footsteps of Simon,[61] have disclosed by clinical and experimental research many important facts in this department of surgery.

The blunt necessity of closing a ureteral fistula and compelling the urine to traverse its natural channel, in the case of a boy who by congenital defect possessed but one kidney, forced Kuester[29] to devise a means of reuniting the ureter to the pelvis of the kidney after preliminary resection. The consequent thought is irresistible, that kidneys are not to be sacrificed for fistulæ, partial obstruction by valvular folds causing intermittent hydronephrosis and strictures of the ureter that interfere to greater or less extent with the functional activity of the ducts, without exhausting every effort to correct the morbid condition. The work of Simon in establishing the practicability of nephrectomy for fistulæ, involving as it did the comforting demonstration of the great and sufficient vicarious activity of the kidney after removal of its fellow, has been followed all too literally by modern operators. But the time has now come when experimental research, coupled with clinical ingenuity, by demonstrating methods of restoring normal conditions, will render much more difficult the task of justifying the sacrifice of so important an organ as the kidney.

The work of those experimenters, Tuffier,[60] Novaro,[37] Gluck and Zeller,[77] Harvey Reed[52] and others, who have tried to prove the feasibility of rectal implantation of the ureters, has met with only a limited and qualified success, and I shall show you by incontestible argument and experimental proof, that the implantation of the ureter into the rectum is in all cases unjustifiable.

Under these circumstances,—on the one hand, compelled by necessity to remove disgusting or perilous conditions, and on the other hand censured by conscience and a growing conservatism in respect to the important urinary glands, if we sacrifice the kidney,—surgery demands new and better methods of dealing with ureteral wounds and diseases. To these demands the writer has devoted the present work.

Anatomy.—The anatomical relations of the ureters have been especially studied by those who have considered means of diagnosis in ureteral and renal diseases. The names of Pawlik, H. A. Kelly,[26] Schultz,[58] Plique,[51] Pantaloni,[41] Poirier,[45] Perez,[42] Hallé,[24] Fenwick,[18] and G. Simon,[61] are especially worthy of mention in this connection. These men have added much to our knowledge of the topographical anatomy of the ureters, so that, following the leadership of Pawlik, the ureters are now catheterized, especially in the female, to determine the character of the secretion of the kidneys individually; and operations are performed upon these ducts which would have been impossible a few years ago, if for no other reason, because of insufficient anatomic and diagnostic information.

The gross and microscopic anatomy of the tubes themselves has been well elucidated in the text-books accessible to all. An especially interesting account of the microscopic anatomy of the ureters is that of Rochard.[56] My friend, Dr. W. M. Tanquary, Professor of Anatomy in the College of Physicians and Surgeons, has kindly communicated to me several points which are not correctly or fully stated in the handbooks.

Thus he states, that upon examining the ureters of over twenty bodies he never found one over fifteen inches long, the average being between ten and twelve inches in length. The ureter when stripped from the peritoneum may be drawn out from two to four inches.

The curvature of the abdominal ureter has its convexity directed inward; while the convexity of the pelvic portion is turned outward. The pelvic portion of the ureter describes a very strong curve, almost the arc of a circle, since the duct hugs the bony wall of the pelvis very closely. Hence the portion of the ureter opposite the uterus is at some distance from that organ, and as the ureter approaches the base of the bladder (which it enters at a point near the

middle of the distance between the urinary meatus and the cervix), it curves rather sharply forward and inward, so that the point in the duct nearest the cervix is below and behind the posterior lip.

It must not be forgotten that the ureter has three points of diminution of caliber which may give rise to mistakes in the search for pathologic stenoses. The first is between one and a half and two and a half inches from the pelvis of the kidney, according to Dr. Tanquary's measurements. The second is at the junction of the pelvic and vesical portions. The third when present (found in three out of five subjects) is just where the ureter crosses the iliac artery.

Nature has protected the ureters in an exceedingly generous way. Scarcely another structure in the body is so little likely to be the subject of external violence. Poirier[45] has especially noted the distensibility and great resisting power of the ureters. Nevertheless such applications of force, as powerful compression of the trunk between two large bodies may rupture the duct. Cases of this kind are cited by numerous writers, among whom are Le Dentu,[31] H. W. Allingham,[1] and Stanley.[63]

Wounds of the Ureter.—From a study of the anatomy of the ureter, one may see that all the pre-requisites to rapid, active regeneration after injury are present. The cells of which the ureters are composed are supplied with large easily stainable nuclei; their functional activity being great, their metabolism must be vigorous; and we know that as a rule, cells that have very active metabolism proliferate very freely. Moreover, the blood supply of the ureters is everywhere most excellent, so that the growing cells are fully nourished.

An excellent demonstration of this vitality and vascularity of the ureter is furnished in a report by Chrobak[12] of a case in which the ureter, although laid bare for an extent of eight cm. in the removal of a sub-serous myoma, retained its function without an adverse symptom.

The function of the ureter, however, is productive of certain conditions which mechanically interfere with the rapid union of wounds. The contractions of the muscular layers of the ureter tend to displace the opposite wound surfaces, while the escape of the urine through the wound, if it be an open one, or the passage of the urine down the duct, if the wound has been sutured or is incomplete, conduces to the same result. Since the demonstration by Billroth of the innocuousness of the aseptic urine about twenty-five years ago, less importance has been attached to local chemical irritation by that fluid.

As a temporary abrogation of function is usually impossible for the ureter, free exit for the urine either down the natural channel, or outward by way of the new opening, and usually through the posterior abdominal wall, must be of great advantage in healing. Drainage of the ureter and of the peri-ureteral space must be of special importance when micro-parasitic complications exist, whether this be simple putrefaction of the urine or active suppuration more or less generalized.

This condition of wound healing, drainage, can be perhaps most easily satisfied when the wound involves the pelvis of the kidney, since the lumen of the duct is there the greatest. When the injury to the pelvis is a perforative one, permitting the escape of urine into the surrounding connective tissue, external drainage is wellnigh imperative. This necessity, moreover, is absolute as soon as we have to do with a condition of suppuration or of putrefaction.

A study of anatomic conditions in the continuity of the ureteral duct and its outlet serves only to emphasize the importance of drainage, since in these parts of the ureter the lumen of the tube is smaller, and the topographic relations are more complicated.

Longitudinal Wounds.—Longitudinal rectilinear wounds of the ureter heal, as a rule, very readily, even when no sutures are applied, if they are uncomplicated and drained. The constant escape of urine from the wound, as is the case with the urethra, insures union of the lips of the wound by granulation. The mucous membrane acts as a barrier to prevent the growth of granulations at points within the lumen of the tube. And the proliferation of the epithelia over the granulations tends to increase the lumen of the tube. Subsequent contraction can not, therefore, result in injurious interference with the walls of the duct. A scar running lengthwise of the ureter could only under rare circumstances do injury by shortening.

Tuffier has made elaborate experiments to justify the application of sutures in longitudinal wounds of the ureter. He has succeeded in applying a row of delicate transverse interrupted sutures through the outer fibers of the tube, after the analogy of Lembert's intestinal sutures, and has had good results, both as regards union of the wound and the subsequent function of the duct. But we can easily see that any suture of the ureter placed transversely and including even a minimum amount of connective tissue, must result in immediate though not necessarily dangerous stenosis, by diminishing the circumference of the tiny cylinder.

The practical inference is that longitudinal wounds of the ureter are best treated, *cæteris paribus*, by the method of open aseptic drainage.

The absolute clinical demonstration that this is a correct conclusion is furnished by the cases to be referred to hereafter in which Kuester and Fenger, in operations upon the upper part of the ureter, left open longitudinal wounds of the duct and with good posterior drainage obtained ultimate complete closure by granulation, with obliteration of the fistulæ.

This rule can not be followed, however, when the wound involves not only the ureter but the neighboring overlying peritoneum, as, e. g., in accidental injuries occurring in laparotomy. Here, from ample experience in operating transperitoneally upon dogs' ureters, I would recommend the interrupted transverse suture advised by Tuffier, through the outer connective tissue layer of the ureter, including if necessary a minute quantity of the muscular coat of the duct. It is important that these sutures be made with very fine silk and very delicate needles. The writer uses the ordinary straight seamstress' needles, called No. 9, with silk twist selected to easily pass the eye of the needle.

The simple technique is as follows: Keep intestines and other viscera out of the way with suitable compress. Trendelenberg's position is indispensable in work within the pelvis. Expose the injured ureter and, if desirable and feasible, have an assistant support or elevate the tube. Apply the sutures as already suggested. Remove from the ureter the pressure and tension of the assistant's forefingers. If, after several waves of contraction have passed down the ureter, indicating the passage of the same number of drops of urine, there is observed to be no leakage, the peritoneum must be carefully adjusted about the ureter, with accurate sutures. This must be done for three reasons: First, the peritoneal coat immediately reinforces the line of sutures, steadies the ureter and assists in preventing leakage. Second, the peritoneal membrane very quickly unites to surrounding structures, so that in a few hours the ureteral wound is provisionally healed. Third, the rapid regeneration of the histologic elements of the peritoneum insures the speedy definitive healing of the peri-ureteral wound, so that the production of granulation tissue is limited to the utmost, and scar contraction is less likely, in the sequel, to interfere with the lumen of the tube. The envelopment of the ureter in peritoneum may be accomplished by either of two methods. The first and best is by lifting the tube gently into the cavity of the peritoneum, drawing the serous membrane carefully behind the ureter and, after pulling the peritoneum around the ureter, stitching it in a position to permanently enclose and protect the vessel. Secondly, the ureter may also be involved in a completely detached fold of omentum which is loosely attached by a stitch to the connective tissue about the ureter. This method is obviously less secure than the first, since the omentum is deprived of its blood supply. Tuffier complicates his technique, which does not include my suggestion of a peritoneal covering, by the temporary ligation of the ureter on the renal side of the wound, to prevent the escape of urine until the row of sutures is complete. Since the normal urine is not capable of setting up peritonitis or of causing suppuration, this precaution is unnecessary and undesirable. It must be carefully observed, however, in the rare abdominal operations upon the ureter, in which the urine is known to be septic.

Numerous pathologic conditions demand exploration of the ureter by longitudinal incision or treatment by drainage through such a wound. The scope of the present work does not permit a detailed study of the pathology of the ureters. The writer commends for study in this department, the works of Assmuth,[2] Neilson,[36] Biard de Bordeaux,[7] Schmitt,[60] Le Dentu,[32] Sutton,[64] Eve,[16] Kobsko[28] and Tourneur.[67]

Pozzi[49] recommends suture of the ureter in cases of accidental longitudinal injury.

The importance of these easily practicable methods can especially be realized when we consider the frequency with which calculi occur in the ureter. These bodies give rise to numerous grave symptoms of diagnostic significance which can not be discussed here. When their presence is recognized, they are removable by longitudinal ureterotomy as

has been practiced successfully in many cases. Numerous writers have reported cases and written papers on the subject. Of these Charles Paul Galland,[19] Gargam,[20] Pousson,[47] Byford,[9] Hall,[23] Lane,[30] Cullingworth,[14] Terry,[65] Berg,[6] Richmond,[55] Godlee,[22] Pick,[44] Ralfe and Godlee,[54] and Twynam [72] are to be named.

It must be remarked, in passing, that ureterotomy has been practiced by H. A. Kelly for stenosis of the ureter, the ureter being reached through a vaginal incision. This mode of reaching the ureter is of great value in treating such cases as those of Coe,[13] in which the ducts were obstructed in the pelvis by inflammatory matter.

Transverse Wounds of the Ureter.—It requires no argument to prove that every incomplete transverse wound of the ureter, when closed by a cicatrix resulting from granulations or from primary union after direct suture, must have a tendency to result in a diminution of the circumference of the tube and consequently also of the lumen. This tendency may be resisted by retraction of the lips of the wound, which always occurs on account of muscular action, permitting proliferation of epithelial cells and allowing them to wander out over the granulations to temporarily and perhaps permanently prevent injurious stenosis. I believe, however, that until we have clinical observations to prove the limits which we can depend upon, we should treat every transverse wound of the ureter involving one-third or more of its circumference as immediately threatening stenosis. The treatment I propose is a modification of the procedure suggested and successfully practiced by Fenger in cases where stenosis had already occurred. The technique is the following: Make two longitudinal incisions, with small scissors, in the ureter beginning at the middle of the wound to be closed. These incisions should be equal in combined length to twice the transverse diameter of the tube. Round off the sharp angles of tissue with the scissors and suture longitudinally with the object of producing a very wide instead of a very contracted lumen. Scar contraction can not now reduce the caliber of the tube sufficiently to interfere with the passage of urine. If this operation has to be performed within the peritoneal cavity the ureter should be protected after the manner described for longitudinal wounds, by drawing about it a fold of peritoneal membrane.

Complete Transverse Wounds.—Many attempts have been made to unite the ureter, when transversely severed, by the ordinary methods of suture. Tuffier[70] of France, has published an elaborate account of his experiments upon dogs to determine the feasibility of the project. He claimed to have succeeded in getting union, but the amount and disposition of the cicatrix were such that when contraction of the scar occurred the tube was rendered useless as a duct.

Experimenters have hitherto been so much discouraged with the results of their trials that their recommendation has been to resort to such make-shifts as implantation into the rectum, the vagina or the skin.

In the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for March 4, 1893, the writer published a method of uniting the ureter after transverse division which answers all the requirements of the conditions. It consists, briefly in the implantation of the upper cut end of the tube into an opening in the side of the lower end. The technique is as follows:

1. Ligate the lower portion of the tube one-eighth or one-fourth of an inch from the free end. Silk or catgut may be used. Make with fine sharp pointed scissors, a longitudinal incision twice as long as the diameter of the ureter, in the wall of the lower end, one-fourth of an inch below the ligature.

2. Make an incision, with the scissors, in the upper portion of the ureter, beginning at the open end of the duct and carrying it up one-fourth of an inch. This incision insures the patency of the tube.

3. Pass two very small cambric sewing needles armed with one thread of sterilized catgut through the wall of the upper end of the ureter, one-eighth of an inch from the extremity, from within outward, the needles being from one-sixteenth to one-eighth of an inch apart, and equidistant from the end of the duct. It will be seen that the loop of catgut between the needles firmly grasps the upper end of the ureter.

4. These needles are now carried through the slit in the side of the lower end of the ureter into and down the tube for one-half an inch where they are pushed through the wall of the duct, side by side.

5. It will now be seen that the traction upon this catgut loop passing through the wall of the ureter will draw the upper fragment of the duct into the lower portion. This being done the ends of the loop are tied together securely and, as the catgut will be absorbed in a few days, calculi do not form to obstruct the passage of the urine.

6. The ureter is now enveloped carefully with peritoneum as already described in other operations, provided an intraperitoneal operation has been done.

This method has many advantages, some of which are as follows:

1. The urine is made to pass through its normal channel.

2. Healing takes place at once without even temporary loss of function or a temporary fistula.

3. No stenosis occurs even after a long interval of time.

4. The ureter can always be united if accidentally injured, at any operation, with materials always at hand.

5. Leakage can not occur, because the upper extremity of the ureter acts as an obstructor to the lower portion of the tube.

6. Scar contraction can never injuriously diminish the lumen of the tube, because the scar which encircles the ureter after union by this method is equal in length to twice the extent of the incision in the side of the lower urethral stump.

Some months after the writer had thought out the above method theoretically, and several weeks after the publication of the preliminary communication, references were found to a method experimentally tried by Poggi[50] of Italy.

This method consists, briefly, in the end-in-end invagination of the upper into the lower portion of the ureter. I believe my lateral method is better for two reasons:

1. Because the invaginated end of the ureter is less likely to be compressed by muscular action of the invaginating portion in the lateral method, since the constricting force can not act so directly at the immediate point of union.

2. In the lateral method the line of permanent and firm union is not a circle, as in Pozzi's method, but an ellipse, so that senescence of the new connective tissue can not result in injurious contracture.

It is not necessary to detail the many experiments made to demonstrate the practicability of this procedure. The following will suffice:

Experiment.—Jan. 17, 1893. Bitch, medium sized, in good condition. Assisted by Dr. A. E. Halstead, I opened the abdomen in the median line through an extent of two and one-half inches beginning at a point one inch above the pubes. Gentle traction upon the bladder caused the ureters to stand out prominently beneath the posterior layer of peritoneum. Opening the posterior peritoneal wall with a snip of the scissors, the right ureter was drawn gently out and cut in two with the scissors at a point about an inch above the entrance into the bladder. The open end of the lower fragment was next closed with a ligature and a slit about seven millimeters long made in the side of the tube just below the ligature. Two needles, armed with a single thread of catgut, were then passed through the wall of the upper portion of the duct from within outward, opposite the slit in its wall which had been made to enlarge the opening. These needles were then passed through the slit in the side of the lower portion of the ureter and their points carried down the tube about one cm., where they were pushed through the wall of the ureter and brought out side by side. By gentle manipulation the upper extremity was drawn into the lower tube and the suture being tightened and tied, the slit was seen to be entirely occluded. Dogs have a very abundant omentum and to simplify the technique the omentum was gently drawn about the ureter and tacked down with two fine silk sutures. The abdomen was closed. Three weeks later the dog which had not been ill after recovering from the anesthetic, was killed. The abdominal wound was completely healed. Upon opening the abdominal cavity much fat was found in the usual places, showing good nutrition. The kidneys were perfectly normal and exactly equal in size and similar in appearance. There was no excess of urine in either pelvis. There was absolutely no evidence of inflammation at any point. The union of the ureter was found to be perfect, as can be seen by examining the specimen which I present and the accompanying cuts from photographs. The omentum surrounds the point of union. (See Figs. 1 and 2).

It is evident upon reflection, that this method of reuniting the ureter after transverse division can be utilized for restoring the continuity of the duct, not only after accidental division, but after division deliberately undertaken for the purpose of removing retro-ureteral morbid tissue in abdominal operations; and after removing a portion of the ureter by resection in continuity for strictures, and for ulcerations about calculi involving annular destruction of the mucous membrane which would eventually terminate in stenosis, if untreated.

That the ureter can sustain a resection involving a considerable amount of tissue is evident, since ureters measuring ten inches while in situ will easily measure twelve to fourteen inches when removed. The operator should remember that the longitudinal muscular fibers tend constantly to shorten the distance between the ends of the duct, so that when the ureter is cut transversely the ends retract considerably. Traction upon these ends is admissible to a very considerable extent, which can not be accurately determined until a larger amount of clinical experience in this direction has accumulated. Meanwhile we may

easily determine in individual cases the amount of material which we may remove from the longitudinal extent of the ureter, in deliberate resections. The force exercised should be moderate in amount but steadily applied for a considerable time, the surgeon remembering that he is overcoming muscular resistance. As the blood vessels ramify tortuously over the ureter, they are in no danger of it being injuriously stretched or lacerated. From these statements it must be seen that for the excision of a constricting band the ureter need not by any means be longer than normal.

That my operation is equally as applicable to human ureters as to those of lower animals has been proved by Dr. Howard Kelly of Johns Hopkins University, Baltimore. Dr. Kelly has informed me verbally that having seen my preliminary description of the method in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, he had an opportunity of applying it in a few days upon a patient suffering from a

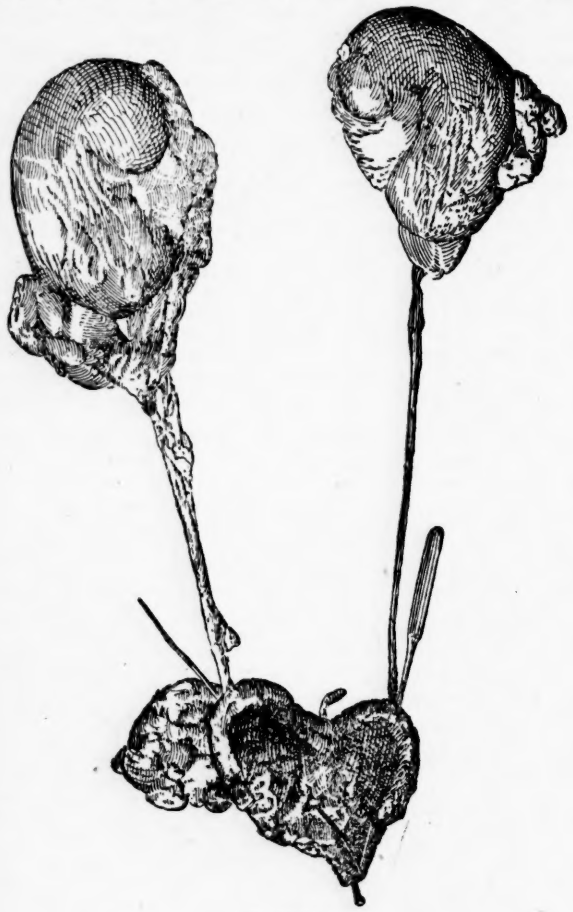

FIGURE 1.

large myoma of the uterus. One of the ureters having been injured during the operation, it was held by forceps until the myoma was removed when it was reunited by my method. The patient made an uneventful recovery. Dr. Kelly will shortly publish a detailed account of the case.[1]

Complete transverse division of the ureter at the infundibulum offers conditions essentially different in many respects from those presented in the continuity of the duct. There the tube is much wider than at the lower part, a fact of which we can take advantage because of the greater mechanical ease with which we can insert sutures; but more especially because scar contraction, as a result of union after suture, is not so likely to prove destructive to the lumen of the tube.

Two pathfinding papers have recently appeared dealing with this subject.

The first of these, by Kuester,[29] described an operation upon a boy who had been operated upon previously for a hydronephrosis involving a solitary kidney. An abdominal renal fistula was left, through which all the urine was discharged. Kuester exposed the kidney and ureter by posterior incision, opened the ureter below the sacculated gland and found two cm. below the kidney, a stricture. This condition he treated successfully by resecting the strictured portion of the tube and implanting it into the hydronephrotic sac. A lumbar fistula remained for several months but was finally cured by a secondary operation.

This instructive operation was borne in mind in the following case, which I briefly report in order to testify to the applicability of the method:

Boy aged 19, suffered from an attack of typical typhoid fever. Following this attack some weeks later he developed a pyonephrosis. Dr. A. E. Halstead, in whose practice the case occurred, invited me to see the case with him. We established a fistula upon the abdominal wall, the sac discharging a large amount of urine. As the fistula remained "permanent" I operated, upon the invitation of Dr. Halstead, for the purpose of restoring the normal channel for the discharge of the urine. The incision was practically that used by Kuester and others, beginning a a point two inches to the left of the posterior median line, carried down for an inch and a half almost straight and then curved forward toward the anterior superior iliac spine. As soon as the anterior lumbar fascia was opened the ureter was discovered without difficulty. It was smaller than normal and seemed to be atrophied. The kidney dilated on account of partial closure of the abdominal fistula, could easily be felt in its normal position. Upon opening the renal sac and allowing part of the fluid to escape, the finger could be easily passed into the pelvis of the kidney, but no stone was felt. I then made a ureterotomy and passed a probe up the ureter to meet the finger; but between the finger and the probe I could distinctly feel a valvular fold of mucous membrane. Concluding that this was the obstruction which had prevented the normal discharge of urine, I proceeded to resect after Kuester's method and succeeded in implanting the ureter into the sac much as he had done. It was now thought best to expose the ureter in the direction of the bladder. Upon passing a probe downward a short distance the ureter was found completely closed, and on careful investigation its lumen was found to be entirely obliterated for several inches. There was nothing left to do but to extirpate the kidney. The patient recovered.

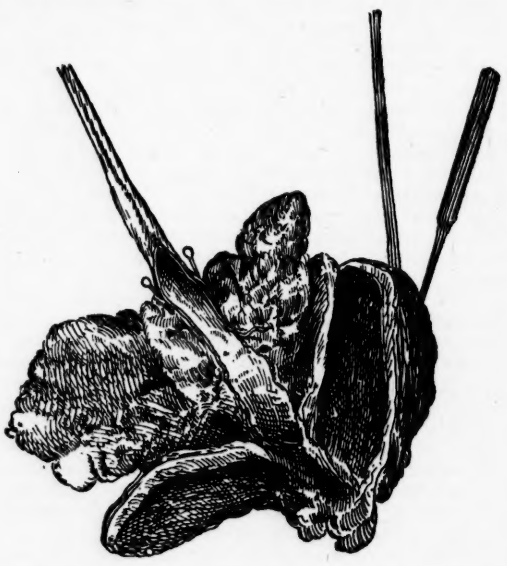

FIGURE 2.

This case, together with Kuester's, fully demonstrated the feasibility of this operation in this condition, and from it I concluded that kidneys should not be extirpated for simple obstruction at the infundibulum.

The second of these papers, that of Dr. Christian Fenger of Chicago, was read before the Chicago Medical Society, Feb. 6, 1893, and was published in the *Chicago Medical Recorder* of March, 1893. Dr. Fenger's first work on stenosis of the ureter was performed May 31, 1892.

In a case of intermittent pyonephrosis, the kidney was opened upon its convex surface and digital exploration made without the discovery of a stone. Catheterization of the ureter was impossible. The pelvis was now opened from its posterior surface. This revealed a valvular opening from the pelvis into the ureter. The valve was then divided transversely and the edges of the wound were united by a suture. A bougie was inserted through the wound in the kidney, brought down into the ureter and retained there for two days. The wound in the pelvis was united by sutures. The floating kidney was secured by nephrorrhaphy, the wound in the kidney drained and the usual dressings applied. The patient recovered without a fistula and had no return of the pyonephrosis.

This remarkable case, so ingeniously treated, is the first of its kind. The method is indeed worthy of commendation and study. It will be found applicable in many kidneys which heretofore would have been ruthlessly extirpated.

The second of Fenger's cases is briefly as follows:

Traumatic stricture of the ureter close to its entrance into the pelvis of the kidney; intermittent hydronephrosis. The patient, 47 years of age, had sustained an injury thirty-four years previously. After ten years the hydronephrosis developed. Operation—lumbar nephrotomy—disclosed no calculi. The ureteral entrance could not be found through

[1] This case has just been published in The Johns Hopkins Bulletin, October, 1893.

the renal opening. The dilated pelvis was opened, but still the opening of the ureter could not be found. The ureter was now isolated and its upper end found to be imbedded in cicatricial tissue for half an inch. Lower down, though small in caliber, the duct was normal. A longitudinal incision one cm. long was now made in the ureter just below the cicatrix. The stricture was one cm. long. It was incised upward into the pelvis. The ureteral wound was now stitched longitudinally, after the manner of the Heinecke-Mikulicz procedure for the treatment of pyloric strictures. No bougie was left in place. The patient made a good recovery without return of the hydronephrosis.

In the first case, Fenger has given us a method of successfully dealing with valvular obstructions at the infundibulum. In this second procedure he has added to our resources for doing away with stenoses of the ureter at the infundibulum. For this condition Fenger rightly claims for this operation the following advantages over the resection of Kuester:

1. It is an operation more economical of tissue and preferable when the elongation of the ureter is not sufficient to permit the two cut ends of the ureter, after excision of the stricture, to come in contact without stretching.

2. It is easier to secure union of a ureter which has been incompletely divided in a transverse direction.

Implantation into the Bladder.—When injury to the ureter at or very near the vesical end, occurs as a result of an accidental or surgical wound, it is feasible to implant the ureter into the bladder immediately, if permitted by circumstances such as asepsis, abundance of time, local anatomic conditions, etc.

Abundant clinical experience proves this statement. In addition, Paoli and Busachi[43] report successful implantations of the ureters into the bladder in dogs. Their success depended upon the splitting of the distal end of the ureter for a short distance and careful suture of this quadrangular opening into a slit in the bladder.

In the human subject the operation field should be left, whenever possible, outside the peritoneal cavity. This result can be secured under certain circumstances only by dissecting the peritoneum loose and stitching it down behind the site of operation, as directed in the description of the plastic extension of the bladder to meet the ureter. The bladder should be kept drained in some convenient manner to annihilate intra-vesical urinary pressure and to limit as much as possible the motion of the parts until union has occurred.

Bocchini[8] has very recently reported an interesting case operated upon by Novaro, in which a vaginal ureteral fistula following hysterectomy was cured by abdominal incision and careful suture of the excised ureteral meatus into the bladder.

Complete transverse injury with loss of substance is evidently one of the gravest ureteral conditions with which the surgeon can be confronted. The methods by which this condition can be met may be arranged under three heads:

1. Methods by which the urine is still made to flow into the bladder.

2. Methods by which the urine is discharged extra-vesically, either into some cavity or directly into the outer air.

3. Methods by which the flow of urine is permanently arrested, either by destruction of the secretory power of the kidney or by its extirpation.

By injuries to the ureter with loss of substance, I would be understood as meaning wounds with a loss of substance too great to admit of utilizing my method of reuniting the tube when transversely divided.

Under the head of methods by which the urine is still made to enter the bladder, we must first consider the methods by which the ureter is substituted by a connective-tissue tube as in the case of Nussbaum.[38] In a case of fistula opening upon the abdominal wall after a laparotomy, Nussbaum passed a properly shaped glass tube into the bladder from the abdominal wound through the connective tissue about the bladder. After the tube had remained in position for some time it was withdrawn and the haphazard procedure was followed by success, although I can not find a record of an examination of the case after the lapse of any considerable time. There are many objections to such an attempt.

1. Infection of the connective tissue about the tube is liable to prove serious, or even fatal.

2. The operator depends upon the formation of a new connective tissue duct to carry the urine permanently into the bladder. This connective tissue is certain to contract as time passes and occlude the lumen of the tube.

3. The new tube can only be lined with epithelial cells when it is very short, since the epithelium of the mucous membrane can not proliferate beyond certain definite small limits.

4. Even if the tube becomes lined with mucous membrane the new epithelium will be poorly resistant, and will be likely to remain a nidus of disease.

5. The method is rarely applicable and is unlikely to be a primary success, on account of the difficulty of making the new tube (especially at the abdominal end) withstand the intra-vesical pressure.

This last point is well illustrated in the following experiment:

Nov. 24, 1892. Jersey calf, male, aged six days, weight cir. ninety pounds, in good condition. Chloroform anesthesia. The abdomen was opened and the right ureter cut in two about three inches above its cystic insertion. The cystic end was ligated. The upper end was carefully sutured into the end of a thoroughly decalcified turkey's wing bone. The urine at once began flowing from the lower end of the bone tube, showing a tight union. The lower end of the bone tube was then sutured as carefully as possible into the bladder. The peritoneum was somewhat imperfectly brought over the tube and the abdomen closed. The calf after recovering from the anesthesia seemed comfortable, drank abundantly of milk, slept and urinated normally for fourteen days when it appeared ill for two days and one morning was found dead. Postmortem. Adhesive general peritonitis was found to have been the cause of death. The kidneys were normal. The right ureter entered an enormous retro-peritoneal sac containing urine and fibrin from inflammation of its walls. The ureter was still fastened into the unchanged bone tube, around which was a perfect tube of new connective tissue. The bone tube was loosely inserted into the bladder and was freely patent. At the point where the ureter entered the bone tube there was an opening communicating with the large sac containing urine. The intra-cystic tonic pressure had caused the enlargement of the cyst until it contained a gallon of fluid.

This instructive though unsuccessful experiment was interesting especially on account of these points: 1, there was a patent canal from the pelvis of the kidney to the bladder; 2, there was no apparent attempt at absorption of the bone tube; 3, the intra-cystic pressure must be, at least temporarily, removed in attempts to replace the ureter by a connective tissue tube. The last very practical observation is especially applicable in case the ureter is implanted directly into the bladder, so that the valve action of the cystic opening of the duct is abolished.

Dr. Christian Fenger in personal conversation in February, 1893, suggested to the writer the use of an isolated knuckle of bowel to supply material for the replacement of ureteral losses. Dr. Joseph B. Bacon of Chicago, soon after published this same suggestion, which was original with him, in the *Chicago Medical Record*. Dr. Bacon proposes to isolate a sufficient length of small intestine, by cutting through the bowel at such points as will leave the isolated loop of intestine well supplied with blood vessels. He would then restore the continuity of the bowel by the use of Murphy's anastomosis button, and implant the ends of the injured ureter into the isolated portion of bowel after closing the ends of the bowel. The urine will then find a continuous channel from the pelvis of the kidney to the bladder.

This very ingenious method, apparently so plausible and captivating, is nevertheless open to the following theoretical objections which could scarcely be controverted by successfully practicing the plan in actual operations upon the human subject:

1. In most operations in which the ureters are injured the resources of the patient are taxed to such an extent that it is better surgical practice to resort to a very rapid procedure, as implantation upon the abdominal wall. This objection may be neglected when the operator is especially skillful in intestinal surgery.

2. The operation exposes the patient to all the risks of resection of the intestine, in addition to those naturally referable to the original operation.

3. The portion of intestine with which it is proposed to replace the lost ureteral substance is necessarily septic; and, as we shall see later on, this septic condition, by threatening the patient with uretero-pyelo-nephritis, absolutely contra-indicates this operation.

One great practical drawback to Dr. Bacon's suggestion lies in the fact that he proposes to do all this complicated work within the peritoneum. If the intestine is ever to be used to piece out the ureter, I would suggest an extra-peritoneal method of doing the operation so far as the ureteral work is concerned. This suggestion is based upon the experiments of Poggi and Tizzoni, an account of which was published in 1888. These investigators succeeded in replacing the excised bladder with a portion of intestine isolated for the purpose. And recently Dr. S. Rosenberg of Hamburg, has succeeded, experimentally, in increasing the size of the bladder by suturing to it a detached piece of intestine I would suggest, as a method less dangerous than that of Dr. Bacon, bringing out the isolated loop of bowel upon the abdominal wall, suturing the peritoneum behind it sufficiently loosely to prevent strangulation of the vessels sup-

plying it, and making a ureteral fistula above the loop of isolated bowel. The bowel may now be embedded beneath the skin with adequate drainage. The secondary operation some time afterward will aim to direct the flow of urine into the now shrunken and far less septic intestine and thence into the bladder. The bladder must be temporarily drained.

This method by the use of intestinal loops can never be of practical consequence, except possibly in those very rare cases in which the ureteral fistula opens upon the abdomen at a point remote from the bladder, requiring on that account a large amount of tissue to fill in the space.

Where the ureteral injury occurs low down, near the bladder, the loss of substance must be considerable, indeed, if the ureter can not be implanted directly into the bladder. This can be accomplished, if the ureter can be drawn down and the bladder drawn up sufficiently, with great ease, as has been described under the head of complete transverse injuries without loss of substance.

(*To be continued.*)

THE ETIOLOGY, MORBID ANATOMY, DIAGNOSIS AND TREATMENT OF INFANTILE HERNIA; OF THE INGUINAL TYPE IN THE MALE.

Read in the Section on Diseases of Children at the Forty-fourth Annual Meeting of the American Medical Association.

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A fully developed hernia is rarely met with at birth; though the conditions favorable to the evolution of it always exist at this time in the male.

When infantile-hernia is met with, it may appear in divers situations; in the simple or complicated forms, single or double; with or without pain.

Inguinal hernia in the male child is commonly associated with ectopia of the testis.

Dr. Wm. T. Bull has said that when a male child is sent to him with hernia, one of the first things he does is to look for the testicle.

When hernia appears under the first year, a common impression prevails that it comes from excessive crying, and when, later one takes his feet, the evolution of the infirmity is charged to injury.

As soon as a hernia is discovered the parent, filled with alarm and knowing that a mass is outside the abdominal-cavity, which belongs within, at once hurries off for a truss and applies it.

The vast majority of such herniæ are recovered from for the time, but in later years generally return. There is a considerable number of cases in which the hernia is never fully developed. The patient may go through life, never conscious of the infirmity. He has a greater fullness in one groin than another perhaps; but as it never occasions any annoyance, he gives it no thought. This is the type in which, when strangulation occurs, the patient will deny with emphasis, that he ever had a hernia; though, on close questioning, will often admit of always having had a fullness high up in the groin.

It has been said that with our advances in civilization and the widespread growth of democracy, that hernia has become much more common than when the social lines were more clearly drawn; when it was a condition peculiarly common among the aristocratic classes. There can be no question, but it is an infirmity of much greater prevalence among the easier classes than among those who toil with their hands for a living. For it has been long noticed that it is commonly seen in the families of those in America in whom the transition from poverty to affluence has been sudden; and in which neither parent or ancestry was afflicted. There can be no doubt either, but all cases of so-called "rupture" are of infantile origin; or rather are attributable to defects of development which antedate birth.

Of late years, radical operations have been recommended for this infirmity early in life. Hernial operations have been revived on an enormous scale, for every type of hernia in the infant and adult. But it does not appear from the ancient literature of hernia, that the *infantile* type was ever treated by direct surgical intervention in past ages.

It would be a great gain, if we could cure all the cases of this malady as soon as we discovered them after birth. But this has proved a disappointment, for but few and uncommon phases of it can be radically treated and permanently cured by surgical methods.

With a view of determining what the chief factors are in the causation of infantile hernia; its morbid anatomy, pathology and treatment, rather than for the purpose of attempting to present anything original, this short essay is offered. It may be added that inasmuch as the technique of surgical operations for it was considered by me in a brochure, presented at the Nashville meeting three years ago, this will not be considered in detail at the present time.

ETIOLOGY OF INFANTILE HERNIA.

The chief predominating elements in infantile-hernia are anatomical; though it is well to remember that this, in common with all other physical imperfections is commonly hereditary. The maldescent of the testis is responsible for more herniæ than all other known causes combined. As this organ leaves its abode from just below the kidney, at about the sixth month of intra-uterine life, it may become arrested in any part of its journey by adhesions and not engage in the abdominal walls at all. This may occur on one side or both. The testis may be wholly absent at birth, and make its descent safely later. As it advances and presses before it the process-vaginalis, it may besides, carry with it a coil of intestine, a fringe of the omentum, or the wall of the bladder. Many times in dissections and operations on the herniæ of infants, I have found the sac of a recent hernia very thick, dense and adherent to the spermatic cord through its whole length, which pathologic condition clearly indicated that the parts were favorable to the advent of a hernial-protrusion, which had no doubt existed not only since birth, but before it, and that it only required the application of a certain force to make the hernia complete.

The funicular-process at birth is very often patent, or imperfectly closed. Later, it becomes completely obliterated when nothing interposes with physiologic processes. But it may remain widely open; and hence permit the intestine to descend into the tunica-vaginalis and lie in immediate contact with the testicle or firmly adherent to it. What is the most common, it remains enclosed in different segments of the cord, from the internal ring out to the gubernaculum testis. Among the lesser elements in causation and aggravation are hygienic conditions, as was some years ago, pointed out by Dr. Frank Parsons of Massachusetts, in the wearing of the tight abdominal binder; besides excessive feeding, and forcing the child to walk too early.

Some authors have cited an excess of the intestine or omentum and an elongation of the mesentery, as important factors. It seems to me that a preternatural diminution of abdominal capacity might constitute an important causation.

From the foregoing, it is evident that as causation differs in this disease, so must treatment be varied; and that while some causes will remedy themselves, others may be obviated; while with a considerable number, the infirmity depends on such conditions as are beyond art to remove they must remain incurable, though not being beyond effective measures of relief.

MORBID ANATOMY.

The underlying ground-work of all infantile herniæ is defective development. In but a comparative few, will we find distinct evidence of recent pathologic changes. How or why remains a mystery, but it is evident that through some occult cause the testis in its march often acquires adhesions to adjacent parts, and thus, while pushing a duplicature of the peritoneum before it, may carry one, or possibly two, fringes of the peritoneum along with it; if not into the scrotum into the inguinal canal. These adventitious sacs or omental masses, in time, if no unusual strain is put on the abdomen, are not occupied by viscera; but contract, become obliterated and practically disappear.

The same may be said of the enclosed funicular process, which state is practically physiological at birth; the infant lying on its back the greater part of its time asleep, at this time of life, with loose, semi-liquid fecal discharges, seldom puts any severe strain on the abdominal walls, and no visible hernia follows. But, let there be atresia of the rectum or urethra; a tightly adherent prepuce, indigestion from improper food or too much of it, with flatulency; then the confined viscera, in obedience to a well-known physical law, will make their way in the direction of the least resistance, and we will have a matured hernia. Whooping-cough or a measly cough in the young infant will have the same effect.

Simple hernial extrusions in the young child will tend to recede and disappear of themselves, if the recumbent position is continued long enough, in a considerable number. The sac contracts, the rings narrow and the canal attains an obliquity. Along with this, there is a shortening of the mesenteric ligament, with an alteration in the seat of intestinal contact with the abdominal wall.

This process of hernial retrogression is not peculiar to small, diminutive protrusions, but applies also as well to those of considerable volume.

In the greater number of cases of ectopia of the testis, hernia is present. In certain cases, it appears that the testis passes down through, making a portal of escape for itself, and then recedes, or is suddenly drawn up inside the abdominal rings by a powerful contraction of the cremaster muscle. For we will sometimes witness a hernial formation in the scrotum, when the testis is not in sight on that side. And in the event of strangulation, as I once said, the testis is in the canal, between the rings, while the extrusion is in the scrotum. We will, too, sometimes find a case in which on one day we will discover the testis in the perineum, another time in the scrotum, again between the rings; and finally, we look for it when it has vanished, to reappear again in the scrotum perhaps the next day. In many cases in which there is a hernia at birth, but the testis has not yet descended, we will observe before the infant has taken its feet, that it has lodged and the extrusion has disappeared or is greatly reduced in volume.

It is only when the testis carries with it into the scrotum either the intestine or omentum, and the congenital type continues, that we will have such a state as will fail of spontaneous relief, or not respond to a tentative therapy. The rings being constantly widened by a substance or structure which acts like a wedge on them, become wider and wider, so that the obliquity of the canal is lost. If omentum is extruded it will hypertrophy in time and acquire an immense volume. It follows, accordingly, that when the testis contracts adhesions with the escaped viscera, the reduction of the hernia will be quite impossible.

But there is a considerable number in which, after the rupture descends, adhesions form, when the type is not essentially what is anatomically known as congenital and which, too, in consequence are quite irreducible.

In babies, we will at times meet with those in which but one element of the abdominal contents is present, viz, a serous fluid. This is commonly called a hydrocele or hematocele, but is in reality, in its elements, clinically and pathologically unlike what is so designated in the adult. Not infrequently it is a genuine cystic formation, of a homogeneous composition; while again it is a pure serous fluid or what is known, physiologically, as lymph.

DIAGNOSIS.

Diagnosis of the inguinal type of infantile hernia is not difficult in the most of cases. But nevertheless, in many forms of cystic diseases of the cord, it is impossible to diagnose with accuracy the contents of a fullness which occupies the scrotum or the upper inguinal region. Manipulation will not do it, nor is transmitted light a reliable test in all. Hypodermic puncture is an important aid, but unless special care is exercised it may do harm, and hence in only exceptional cases is its employment to be recommended. But in mixed complicated cases in which there are both cystic disease and hernial protrusion, its use may lead us into the error of assuming that a mere tapping will effect a cure of the case; while as a matter of fact, it will fail in this; besides perhaps lead to puncturing the bowel or peritonitis.

Unless a hernia seems to be a source of pain and is increasing in volume, there is no pressing necessity for determining what the mass is; besides, nothing is lost by waiting.

In reducible hernia it is not difficult to recognize an epiplocele from an enterocele; but in mixed cases, those which predominate in infants, this will be quite impossible.

TREATMENT.

The treatment of infantile hernia of the inguinal type, in the absence of complications, should be on tentative lines. It is only in exceptional and unusual cases that the question of operation will arise.

It will be borne in mind that those cases here described only embrace that class which are seen in the suckling infant before walking begins.

The treatment will have reference to a few things mainly:

1, diet; 2, clothing; 3, rest; 4, support or pressure;

5, removal of such causes as occasion straining; 6, radical operation.

Diet.—When the infant is a suckling, nothing need be done in the way of dieting it, only, if the mother is constipated, she should be given sufficient of an aperient to act moderately on the bowels of the infant, through the mother's milk. But in modern times, when so many mothers are over-fed and under-exercised, or are the partners of ardent husbands, they either have no milk, it dries up, or is unfit for the infant; when resort must be had to artificial diet. The infant commonly over-eats, overloads the intestine, or in consequence, accumulates an undue amount of fat in the omentum. If digestion is disordered, he has gaseous distension from alimentary fermentation, when the abdominal walls are put on a severe strain.

Caution should be exercised, then, when the natural aliment is cut off from the herniated infant, not to over-feed, nor give food of improper quality. Harm is apt to rather follow too much than underfeeding.

Clothing.—Little need be said as to the quality of clothing. The infant must be comfortably clad. The only question is with regard to how the garments are adjusted. The tight encircling band which has been so long applied over the lower thorax and entire abdomen, when adjusted, under the old orthodox rules is quite certain to render the spontaneous cure of a hernia impossible. Hence, in every case, this should be cast aside. The abdominal muscles should be allowed the freest possible play, and the peristaltic movements of the intestine be in no manner hampered by an artificial pressure of any description whatever.

To overcome this deleterious action of the binder, Dr. Frank S. Parsons has advised that the garments covering the trunk and extremities should be adjusted to, and suspended from the shoulders. (The Hygiene of Infant's Clothing, JOURNAL OF AMERICAN MEDICAL ASSOCIATION August, 1890. By Frank S. Parsons.) Those of us who have given this subject a special study must indorse Parson's views, and commend his special hygienically-made infant wearing apparel.

Rest. — Physiologic-rest, of all known agencies is one of the most potent, as an aid in the therapy of every species of hernia, and at every stage of life. This element of rest is what so powerfully contributes towards the recovery of infantile hernia. The baby lies in a quiet state in the horizontal position a large share of his time, and when he comes to sit up, yet the parts in the region of the infirmity by this attitude, are in a favorable state for restoration to the normal condition. The depression of the inguino-femoral fold, the pressure downward of the abdominal parietes and upwards of the convexity of the thighs exert a forcible influence in relaxing the fibers in proximity to the ring, and the recession of the visceral displacement. Therefore, in the herniated infant particularly when the mass is of considerable volume, the lying and sitting positions should be encouraged, as long as possible. Creeping or walking "on all fours," on the hands and knees, thus carrying the spine in a horizontal direction, and equally distributing the weight over the anterior abdominal walls, no doubt, is a necessary and salutary exercise, when the infant has reached the first year or before it. But the practice of forcing an infant into *early* walking, carrying the spine erect and putting a severe strain on a weakened part is a vicious one considered in any light, to the herniated, as it not only interferes with the reparative efforts of nature, but it likewise greatly aggravates the preëxisting condition, rendering subsequent treatment more difficult and unsatisfactory.

Support or Pressure.—My own experience has been that a small painless hernia which shows no tendency to enlarge, will do better by entire non-interference, than by too much, or the misdirected application of pressure. Parents are naturally apprehensive when a hernia is discovered, that it will become worse with time, and expect something more than an encouraging promise; besides perhaps, with many of these simple cases, a simple bandage support will probably do no harm. But before we apply anything, let us be assured that the testis is well down and that the supposed hernia is not a simple cyst. With these cases the hank-truss so-called, made of a couple of skeins of worsted, or the simple pad and spica bandage, amply suffice. The general use of the spring truss in infantile hernia is a bad practice. Its adoption is to be prohibited, except in those cases, in which the medical attendant is permitted to keep the case under constant observation. Those trusses with a strong spring, do incalculable harm. By their pressure they often not only prevent the testis from fully descending, but they likewise induce adhesions of it with other parts. Simple reducible hernia they render irreducible, in many cases; and in many too, by their constant pressure, they induce atrophy over the rings which they are supposed to strengthen. When the child takes his feet is the time when the truss plays an important rôle; until then its employment must be guarded by an intelligent supervision.

The removal of such causes as occasion severe straining.—It goes without saying, that in every case, before any thought of treatment is entertained, we should first institute a searching inquiry as to the etiologic factors. If the hernia be an inheritance, when once reduced, it should be remembered that, as a tendency to relapse remains throughout life, it may be a wise precaution, as a prophylactic measure, to recommend the wearing of some sort of support over the inguinal rings.

In all cases, we should be assured that there is no impediment in any part of the urethral or rectal passage.

Operation for radical cure.—As the operation for radical cure of hernia is rendered devoid of pain and is attended with little or no danger to life, the temptation to perform it is very great; when we can practically promise success in every case. But when we bear in mind that the greater part of infantile cases will spontaneously disappear; and as we know, now, that very few operations for radical-cure produce permanent effects, we should hesitate to ever recommend surgical intervention in any, except certain complicated cases, presenting unusual characters.

The cases of infantile inguinal hernia which require operation are; 1, those in which there is a marked tendency to increase in volume; 2, those which are attended with severe pain and 3, those in which there are extensive adhesions between the testis and viscera, and there are no possible prospects of reduction or cure without radical methods. With these exceptions none should be treated by any other than ordinary, safe and tentative means.

The technique of operation is practically the same for the young as the adult. Although it is quite impossible to preserve the dressings from the urine; on being displaced, the wound heals well.

It is well in this latter class to require the wearing of some sort of support for a year after operation.

As the scope of this paper will not permit it, I have purposely refrained from including the various complex types of inguinal hernia; besides those which present in the umbilical, femoral and other regions; which overlie or are continuous with the abdominal cavity.

THE TREATMENT OF CHOREA BY LARGE DOSES OF QUININ.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

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Of the various theories that have been advanced from time to time, in the effort to elucidate the etiology of chorea and to localize the affection; that is, to ascribe to the choreic movements either a cerebral, or a spinal, or a conjoined origin, that of a diminution or loss of spinal inhibition recently proposed by Prof. H. C. Wood in a contribution read before the Philadelphia Neurological Society and published in the *Journal of Nervous and Mental Diseases* for the month of April, may be accepted as preeminently a rational one; a theory that is based upon sound scientific investigation and deliberate ratiocination. We would invite a perusal of this very interesting paper, as giving in a more concise and intelligent manner than any resumè we could offer, the various steps that led up to the enunciation of the theory suggested. In the meanwhile, permit us to review briefly some of the principles involved in this line of study of the motor function of the cord, with its physiologic and pathologic manifestations.

It appears to be a fundamental law that certain highly specialized cells of the nervous organism have relegated to them powers that are dominant; whose function it is to dominate and regulate other cell-groups not so highly specialized in the assignment of the complex workings of the body. Especially is this law exemplified in the familiar manifestations of the well-known cardio-inhibitory center of the vagal nucleus, and in the intensely interesting and intricate phenomena of thermotaxis. That group of cells to which has been alloted the power of inhibiting the motor function of the spinal cord is designated as Setschenow's center, which, in the frog is placed in the optic lobes, and in man and the higher vertebrates is believed to be situated somewhere in the corpora quadrigemina or medulla oblongata. Whatever may be its precise location, it is undoubtedly true that stimulation of this portion of the brain-substance will be followed by a marked diminution in the reflex activity of the cord, thus demonstrating at once the dominating influence of the center over the motor tracts of the cord beneath.

Spitzka, in the *Reference Handbook of the Medical Sciences*, has aptly said: "The spinal cord is essentially a segmental organ;" in the typical vertebrate it may be regarded as made up of a series of nerve centers, fused into a column, "each center corresponding to a somatic segment, with which it is connected symmetrically by a pair of spinal nerves. Each one of these spinal segments corresponds in its topographical situation with the somatic segment which its nerves supply, and these nerves take a direct transverse course, leaving the cord at right angles to traverse the intervertebral foramina and thus reach their somatic destination."

Stimulation confined to any one of these spinal centers,—thus directly or absolutely augmenting its motor power, or its function of motor discharge, or the cutting off from any one such center of the inhibitory action of the dominant center in the brain above—thus, primarily, indirectly or relatively, and secondarily, absolutely, increasing its motor power, will be accompanied by spasmodic muscular contraction in the somatic segment supplied by the implicated center. This is self-evident. Now, generalizing, suppose that the direct stimulation be applied to the spinal centers as a whole, the entire cord, simultaneously, or that the inhibitory action instead of being removed from a single spinal center be very perceptibly diminished, or absolutely cut off from the entire cord, and it will go without saying that all of the somatic segments supplied by the spinal motor nerves will be involved in the exaggerated discharges of motor force, and that the muscular system of the body will, so to speak, run riot. Prof. Wood, from his studies in this direction would ascribe to chorea some such origin as this. He suggests that the direct cause of chorea lies in a disturbance or overbalancing of the equilibrium that normally exists between the motor power of the spinal cells and the inhibitory apparatus of the spinal cord located in the so-called Setschenow's center of the brain, the latter in choreics being involved in a paresis more or less marked. During inhibition the function of an organ is restrained; during paralysis it is abolished. The amount of disturbance will depend entirely upon the degree of loss of inhibition. Thus may be accounted for the varying grades of choreic manifestations, from the slightest case of so-called spinal irritation with the characteristic unrest and ebullition of nerve force and the exaggerated reflexes of the neurotic individual, to the grave cases of chorea major with absolute loss of control of voluntary muscular effort, and finally, diminished or absent reflexes from exhaustion and depression of the entire motor area of the cord.

Nowhere is the perplexing uncertainty that surrounds the true etiology of chorea better demonstrated than in the very recent work of Landon Carter Gray. In it, he gives a varied list of causes of the disease, covering the most remote possibilities and including such unsatisfactory etiologic factors as the seasons, the emotions, malaria, race, eyestrain, as well as the more definite causes; trauma, articular rheumatism, imitation and heredity. After such an array we would naturally expect to hear him say that although certain cerebral changes have been well described in the chronic and fatal cases, as well as of the disease in animals, there has never been any approach to a description of the pathologic alterations that would explain the movements of the

ordinary cases of chorea of the Sydenham and athetoid types. We would suggest that at least an intimation to this "approach" is made by such an explanation as the ingenious inhibitory theory of Prof. Wood.

So much, however, for the physiology and pathology of the subject; now for the direct application of the principles thus hinted at, for as far as is possible, all therapeusis should be based upon the results of physiologic investigation and its ultimate rational conclusions. Accepting the premise, and regarding chorea as due in all probability to a diminution or loss of the inhibition power of Setschenow's center, it is evident that our efforts, therapeutically, should be directed toward the employment of such remedies as will tend to increase or restore the diminished or lost inhibitory power. Hitherto the drugs that have been exhibited in the treatment of chorea have been of two classes; either those whose action upon the nervous system has been confined to the motor nerves—direct paralyzants of the motor nerves and their peripheral filaments; or those whose physiologic effect upon the nervous organism has been that of a powerful depression of the spinal centers. To the former class belong the bromids, lobelia, and the more recently revived remedy, conium; while in the latter would be grouped arsenic, calabar bean, chloral, cimicifuga and antipyrin. Antipyrin alone reaches a little farther in its action, and exerts upon the cerebral cortex a peculiar sedative influence.

In quinin, however, we have a remedy whose action upon the nerve centers differs radically from that of the remedies we have as yet mentioned. Since the researches of Chaperon, thirty-five years ago, repeated experiments in the physiological laboratory have abundantly demonstrated the soundness of his claims. The direct stimulating action of quinin upon the so-called inhibitory center of the cord, even in small doses, is now thoroughly established. Undoubtedly, during its exhibition, there is a remarkable diminution in the reflex activity of the spinal centers. In cinchonized animals the discharges of motor force are sensibly lessened, and this spinal inhibition increases *pari passu* with the degree and duration of the cinchonism. This interesting observation suggested to Prof. Wood the possible utility of quinin in the chorea of dogs. A choreic animal in the Hospital of the Veterinary Department of the University of Pennsylvania, was subjected to the method of treatment, and with a most interesting and satisfactory result. Within one week from the initial dose of quinin, as Prof. Wood records, the spasmodic muscular movements had almost entirely disappeared. With this indication to its still further applicability in the management of convulsive spinal affections, choreic patients visiting the dispensary for nervous diseases in the University Hospital were placed upon the quinin treatment under the direct supervision of Prof. Wood and Dr Potts. While the time that has elapsed since the commencement of the treatment has been short, and the number of patients limited, the results obtained thus far have been, to say the least, gratifying. In but four instances did the disease fail to respond to the influence of the drug. A synopsis of the cases so treated is appended:

Case 1.—L. C., age 14, female. Is attending school. Family history good. Has had all the diseases of childhood, including scarlatina. Her first choreic attack was noticed on January 1, the twitchings beginning in the tongue. The movements at the time of her first visit, on the 19th of January were general and severe. She had difficulty in talking, and at times bit her tongue. She was given quinin gr. iv, every three hours until cinchonized, and then three times daily. January 21. Movements still present, but much better. February 24. Reports nearly well.

Case 2.—M. A., age 14, female. Attends school. Reported at the dispensary on the 9th of December, 1892, suffering with her second attack of chorea. The movements had begun a few days before, subsequent to a febrile attack. No history of rheumatism. The movements were general. She was placed upon increasing doses of Fowler's solution and iron and this treatment was continued without marked benefit until Feb. 11, 1893. She was then given quinin gr. iv, four times a day, with immediate and considerable improvement. She was under this treatment for ten days, at the expiration of which time she reported herself as cured.

Case 3.—E. F., age 8, female. Attends school. Reported first at dispensary March 14, 1893. The choreic movements had been noticed since the first of January, the attack having followed a fright. They began in the left arm. At the time of her visit the entire left side was affected. Her speech was thick, she complained of pain in her left knee, and her mother said that she had enuresis since the chorea began, although perfectly healthy previous to this. The family history was good. She was placed upon quinin gr. iv, q. d. March 17. Reported much better, and did not return. The presumption is that she was cured.

Case 4.—L. D., age 10, female. Attends school. February 24. Visited the dispensary with the second attack of chorea, which had lasted then for about a week. The movements were confined to the right side. No rheumatism. Was given quinin gr. iv q.d. February 27. Mother reports great improvement. March 13. No movements noticeable. April 5. Return of some movements. The quinin was continued and syr. ferri iodid, gtt iii and emul. ol. marrhuæ f℥i t. i. d. added to the treatment. April 19. Reported with complete disappearance of choreic movements.

Case 5.—L. K., age 14 years. School girl. March 1, 1893. Came to the dispensary with slight choreic movements, affecting principally the muscles of the face. This is her second attack, the first one occurring when a year old and lasting three years. She was ordered quinin gr. iv q. d. March 13. Her mother reports that she is much better. Cinchonism present. May 1. Came back with return of symptoms which she says commenced soon after stopping the medicine. The same treatment as before ordered was advised; at this date May 17, 1893, she has not returned.

Case 6.—M. H., age 9, female. Attends school. Nov. 7, 1892. First visit, the attack being of two weeks' duration. The movements began on the left side which is now the worst, though both sides are affected. No history of rheumatism or other acute diseases. Has always been nervous. Heart's action rapid. Was placed on increasing doses of Fowler's solution without improvement. December 6. Is taking 10 drops of Fowler's solution with compound syrup of the hypophosphites. Some gastric irritation present. December 19. Considerable irritation. Reduced to 5 drops. January 25. Choreic movements somewhat better but has developed neuritis in both legs. Was given quinin gr. iv t. i. d. February 8. Choreic movements have nearly disappeared. Has not completely regained the power in her legs, but they are much improved. February 21. No evidence of chorea visible.

Case 7.—D. K., age 12 years. Male. Attends school and works on a farm between times. Visited the dispensary April 12, 1893, suffering from his first attack of chorea. The movements were very severe involving both sides; could only feed himself with difficulty and his speech was so much affected that it was almost impossible to understand him. Quinin gr. iv q. d. was ordered. April 15. No better. Dose increased to gr. iv five times daily. April 17. No improvement. Increased to gr. vi q. d. April 21. About the same. Ordered Fowler's solution gtt iii. t. d. April 26. Somewhat better. Is taking five drops of Fowler's t.d. May 11. Is nearly well. Fowler's gtt. x t. d.

Case 8.—R. B., age 11, female. Attends school. Was treated at the dispensary for her first attack of chorea from April 26, 1892 to Aug. 9, 1892, with arsenic and tonics. No movements when she stopped treatment. Returned March 14, 1893, with slight movements. Was given quinin gr. iii, five times a day. March 17. Reported worse. April 7. No improvement, when she was again placed on Fowler's solu-

tion, gtt. iv t. i. d. April 17. Much better. Is taking gtt. vii of Fowler's. May 2. Not so well. Fowler's increased to gtt. ix t. d. She has not returned at this date, May 17, 1893.

Case 9.—M. C., age 14 years. School girl. April 10, 1893. Returned to the dispensary with her second attack of chorea. Her first one occurring about one year ago. The present attack has lasted several months. Both sides and speech affected. Ordered quinin gr. iv q. d. April 13. Seems considerably better. The dose of quinin increased to gr. iv five times a day. April 21. Choreic movements have almost disappeared. May 11. Return of some movements involving principally the hands.

Case 10.—M. D., age 7, admitted to the Hospital suffering with marked chorea of several weeks' duration. Gait very unsteady almost staggering. Unable to feed herself. Was placed upon Fowler's solution for one week with but slight improvement. Three grains of quinin were then given in solution five times a day. In three days there was a very perceptible diminution in the choreic movements. In two weeks she was able to use her hands in eating; in another week the choreic tremor was no longer noticeable. With the improvement in this respect, there occurred also a change in her disposition, the child becoming brighter and more playful. Fifteen grains of quinin were administered daily for three weeks without the slightest sign of cinchonism. Appetite remained good throughout.

Case 11.—M. B., age 12. School girl. May 16, 1893. Second attack. Slight chorea for one week, preceded by rheumatic pains. Was given quinin sulph. gr. iv q. d. May 22. Chorea worse; gr. vi t. d. Pil. iron and strych., t. d. May 25. No improvement; Fowler gtt iv t. d. Not reported since.

Case 12.—A. L., age 14. School girl. May 15, 1893. Chorea since March, both sides and speech affected. Mother has had convulsions of epileptic character. Was given quinin sulph. gr. vi t. d. May 22. Better; gr. vi t. d. and pil. of iron and strych., t. d. May 29. Much better; is taking quinin gr. xxvii daily.

Case 13.—M. A., age 12. School girl. May 13, 1893. Second attack; first one in 1891. Movements in left side of moderate severity; do not cease during sleep. Was given quinin gr. iii t. d. May 17. No better; gr. vi q. d. Strych. sulph. gr. one-sixtieth t. d. May 20. About the same. Was given Fowler's solution gtt iv t. d. May 24. No better; gtt v. May 29. Slight improvement.

Case 14.—C. S., age 14. Salesgirl. May 13, 1893. More or less choreic movements of muscles of face for past four years. Lately these have involved entire body. Was given quinin sulph. gr. vi t. d. May 17. No better; gr. vi q. d. May 19. Much better. Syr. hypophos. Co. ℥i t. d. May 27. No chorea.

Case 15.—D. R., colored, age 10. School boy. May 24. Has had choreic movements for one year, which of late are much worse; both sides and speech now affected. Was given quinin sulph. gr. iv t. d. May 29. Better; gr. iv t. d. and pil. iron and strych.

This record must be left to speak for itself. It will be noticed that in a number of the cases almost immediate improvement took place, which continued for a time, after which relapses occurred. This occurrence, it seems to us, may be due to the fact that the quinin merely acts as a stimulant and, like all stimulants, loses its effect in time to be followed by depression. Therefore, so far as any conclusions can be drawn from such a limited number of cases, it would seem that the best treatment for chorea would be the administration of large doses of quinin to lessen the severity of the movements,, adding at the same time measures to build up and strengthen the depressed nervous system. This seems to be shown in Case 4 where final cure only took place after the administration of cod liver oil and iron, and also in Case 10, where cod liver oil also had to be administered after a time.

Another fact worthy of emphasis is the large doses that the majority of the children could take without any evidence of cinchonism. Finally, we do not claim that quinin is an absolute cure for chorea, and that from this time no such thing as failure in the treatment of such cases will be recorded. It should be borne in mind that after the chorea has been of long standing, and the loss of inhibitory power considerable or absolute, there result organic changes in the motor cells of the cord, with the development of an atrophic condition. In such cases it is probable that failure will be the result of any form of medication, however rational. What is claimed is, that in the acute form of chorea, the results thus far obtained from the administration of quinin in large doses have been such as to warrant a further investigation as to the merits, immediate and ultimate, of this line of treatment.

STATISTICS OF INTUBATION OF LARYNX, AND EXHIBITION OF IMPROVED INSTRUMENTS.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY F. E. WAXHAM, M.D.

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In again consenting to present a paper on the subject of intubation, it is with the thought that increased experience and the accumulation of a larger number of cases may be a more convincing proof of the utility of the operation.

It will be seen that out of the first 100 cases, there were 27 recoveries; of the second 100, 34; the third 100, 40; the fourth 100, 38, and out of the last 66, 22.

Fig. 1.

It is often said that intubation is done early, and that this accounts for the large percentage of recoveries, but this is a great mistake. The operation is only done as a last resort, and often after the patient has become moribund and unconscious. Not infrequently patients have been *in extremis* before I have been summoned, and upon arriving have been found dead. More than nine-tenths of these cases have been seen and operated upon through the courtesy of other physicians, and there has been no opportunity for operating early, even had there been a desire to have done so. Neither have these been selected cases; all have been operated upon, from the young infant to the aged patient, without reference to age, malignancy of disease or unfavorable surroundings. Considering the fact that the great majority of these cases have been among the poor and destitute, where it has been impossible to properly care for or nurse them, the results seem highly gratifying.

FIRST ONE HUNDRED CASES.

Age.	No. Cases.	Recoveries.	Percentage.
Under one year	5	1	20.00
1 year	13	2	15.38
2 years	22	4	18.18
3 "	17	2	11.76
4 "	15	7	46.66
5 "	9	3	33.33
6 "	5	2	40.00
7 "	8	2	25.00
8 "	4	3	75.00
9 "	1	1	100.00
10 "	1	0	00.00
	100	27	27.00

SECOND ONE HUNDRED CASES.

1 year	17	5	29.41
2 years	15	2	13.33
3 "	14	4	28.56
4 "	22	7	31.81
5 "	9	6	66.66
6 "	8	3	37.50
7 "	6	4	66.66
8 "	1	1	100.00
9 "	3	2	66.66
10 "	1	0	00.00
12 "	2	0	00.00
13 "	1	0	00.00
14 "	1	0	00.00
	100	34	34.00

THIRD ONE HUNDRED CASES.

Under one year	5	2	40.00
1 year	11	2	18.18
2 years	13	5	38.46
3 "	19	11	57.72
4 "	22	9	40.90
5 "	10	5	50.00
6 "	7	1	14.28
7 "	6	3	50.00
8 "	2	0	00.00
9 "	2	0	00.00
10 "	1	1	100.00
20 "	1	0	00 00
43 "	1	1	100.00
	100	40	40.00

FOURTH ONE HUNDRED CASES.

Under one year	2	1	50.00
1 year	11	3	27.27
2 years	20	7	35.00
3 "	19	10	52.63
4 "	20	7	35.00
5 "	11	4	36.36
6 "	5	1	20.00
7 "	5	1	20.00
8 "	3	2	66.66
10 "	2	1	50.00
11 "	1	1	100.00
60 "	1	0	00.00
	100	38	38.00

LAST SIXTY-SIX CASES.

Under one year	1	0	00.00
1 year	10	1	10.00
2 years	11	7	63.3
3 "	16	5	31.25
4 "	11	5	45.45
5 "	4	1	25.00
6 "	1	0	00.00
7 "	4	0	00.00
8 "	3	2	66.66
9 "	1	0	00.00
10 "	2	1	50.00
12 "	1	0	00.00
36 "	1	0	00.00
	66	22	33.33

TOTAL CASES.

Age.	No. Cases.	Recoveries.	Percentage.
Under one year	13	4	30.76
1 year	62	13	20.96
2 years	81	25	30.86
3 "	85	32	37.64
4 "	90	35	38.88
5 "	43	19	44.18
6 "	26	7	26.92
7 "	29	10	33.33
8 "	13	8	61.53
9 "	7	3	42.85
10 "	7	3	42.85
11 "	1	1	100.00
12 "	3	0	00.00
13 "	1	0	00.00
14 "	1	0	00.00
20 "	1	0	00.00
36 "	1	0	00.00
43 "	1	1	100.00
60 "	1	0	90.00
	466	161	34.54

In this connection, I take pleasure in presenting a modified case of instruments which I hope will prove of great value. If any instruments should be aseptic these certainly should be, and we are not meeting the demands of modern surgery unless all our instruments can be rendered perfectly aseptic. Through the courtesy and coöperation of Chas. Truax, Greene & Co., of Chicago, I am enabled to present this case of instruments which I believe to be a great improvement over previous ones. The case itself, as you observe (Fig. 1) is metallic and can be boiled or washed with antiseptic solutions without injury, and there is no plush lining in which to carry about the germs of the disease. The introducer (Fig. 2), varies in several respects from the ordinary instrument. The obturator has no joint and is attached to the introducer, while the different parts of the instrument can be separated and perfectly disinfected. The novice will find this introducer very much easier to use than the original one. The extractor is peculiar, in that all its parts can be separated as you see, (Fig. 3). The gag is made so that it can be unlocked, the two blades separated and disinfected. (Fig. 4.) Thus you see there are no crevices in which germs can find a hiding place beyond the reach of antiseptics. In presenting these instruments, it is with the conviction that they will prove a valuable aid to us in the treatment of one of the most dreaded diseases of early life.

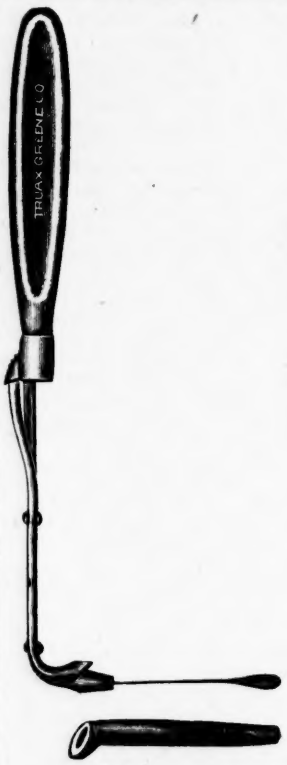

Fig. 2.

Fig. 3.

Fig. 4.

PRIMARY SYPHILIS AND GONORRHEA IN CHILDREN.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY B. MERRILL RICKETTS, M.D.
CINCINNATI, OHIO.

In presenting this subject, I wish to call attention to the comparative infrequency with which these diseases are found in children under twelve years of age, and the tendency to overlook their characteristics; also to report the cases that I have seen bearing upon the subject.

That the Hunterian chancre is not at all times recognized, when found upon adults, there can be no question. That it is less likely to be recognized when found upon children, especially when it is found upon other parts of the body than the genitals, is a foregone conclusion. The infrequency with which this lesion is met with in children, together with the few opportunities the average practitioner has of seeing it upon any other part of the body than the genitals, is no doubt the occasion of its being so often overlooked.

These rules hold good in cases of primary gonorrhea in children. To identify an acute inflammatory urethritis or vaginitis as being gonorrheal is a task not always easy, especially since the discovery of the gonococcus.

The identification is especially troublesome when there is but one child affected and the cause unknown. As I did not intend to enter into details in describing these primary lesions, but merely to report the circumstances surrounding each of them, together with the more prominent features, I must refrain from speaking of the etiology, treatment and subsequent results, none of them having remained under my care.

Case 1.—Male, age 12; white; German; robust; of humble parents, both of whom were dead. Accompanied by a friend he consulted me in 1887, complaining of a sore about the anus. Upon examination I found a hard chancre, about two weeks old. I found, by persistent questioning, that the boy had been the victim of buggering. That about four weeks previous a young man about eighteen years old, had practiced his vile habit upon this boy, whether willing or unwilling I was unable to decide. The throat was sore and the temperature 99 degrees. I advised treatment, but the lad never came back.

Case 2.—Male, age 12; white; robust; dark hair and eyes, was brought to me by his father in the fall of 1892. There was an extensive macular eruption over the whole body and extremities. The throat was very much ulcerated and temperature 100½ degrees. Rheumatism was complained of, and his general appearance was bad. I informed the father that the boy was suffering with syphilis and that he had contracted it within six weeks from that time. I accused the boy of having done something, but he would not admit anything until I had a private interview. He then admitted that a man had thrown him down in a stable and had attempted to do something to him in his back parts some eight weeks before. Upon examination I found the remnants of what I believed to be a hard chancre. Everything pointed to the boy's statement having been true. I found that Dr. W. E. Lewis had been treating the patient, and I at once proceeded to ascertain all I could about the case. Dr. Lewis informed me that he had found a sore together with warts. I at once referred the patient back to Dr. Lewis for treatment, and I find that this was carried out with the usual results.

Case 3.—Male, age 7; white; robust; brought to me with a sore upon the lower lip, about the median line upon the vermillion border. The lesion was about the size of a silver five cent piece and presented the usual characteristics. I could not find any history whatever, so that I was compelled to rely upon subjective symptoms entirely. The temperature was 101 degrees, face flushed and conjunctiva congested. The submaxillary glands were somewhat enlarged, and the body and extremities covered with a fine macular eruption. The mother stated that the sore had existed for about three weeks. She gave no evidence of having syphilis, nor could give me anything to show that her husband did not have the disease. The family was poor and no doubt associated with the demi-monde, whose lips so often carry with them the messenger of misery and death. To my mind this was the source of infection. Although advised to have the child treated, I was never again permitted to see it.

Dr. David DeBeck of Cincinnati, has tabulated ninety-seven cases of primary syphilis of the eyelids having occurred in the practice of the various oculists of the world. This monograph is well worth reading, the cases having occurred in both adult and child life.

ACUTE GONORRHEA.—(SEVEN CASES.)

This is exceedingly interesting, especially as the origin in each case was discovered:

Case 1.—Female, age 7; robust; poor parentage; blonde; acute gonorrhea.

Case 2.—Female, age 10; robust; poor parentage; blonde; acute gonorrhea.

Case 3.—Female, age 11; frail; poor parentage; brunette; acute gonorrhea.

Case 4.—Female, age 9; robust; poor parentage; blonde, acute gonorrhea.

Case 5.—Male, age 9; wiry; black-eyed; poor parentage; quick, active and looked upon by the neighbors as the toughest of the Arabian type. This lad had a discharge evidently of six weeks' duration. Had it been but three or four weeks old, I do not believe that he would have felt much like attempting such a feat. The girls represented four different families, however, there were but three mothers who accompanied the four girls to my office. The statement of the girls was identical in the main, although given privately at different times. Each had a serious discharge, with great itching and tenderness, together with extensive swelling of the labia. Although I did not make a thorough examination, I am satisfied that the lad did not penetrate very deeply. It was, however, of sufficient depth to infect each child. I could not determine the exact day it occurred, but would say some time within two weeks. The indications were, that each girl consented to it. In regard to the boy, I was unable to secure any information whatever. He was as cool and unconcerned as though nothing had ever happened. He was an experienced street urchin, whose life had been hardened by contact with the inhabitants of Gano Alley, a place which can not be surpassed in corruption and immorality. That he was a frequenter of this district was well established, but who his seducer was will always remain a mystery.

But one of these cases was ever again seen, and that on the following day, so I can not speak farther.

Case 6.—Female, age 11; white; robust; with dark hair and eyes, was brought to me by her mother who was a poor woman, earning her living as best she could, her husband having died leaving but little. She stated that her child had done wrong and that she had a discharge. I found that there was a purulent discharge with much redness, itching and tenderness. Upon questioning, I found that they lived in a district parallel to Gano Alley so far as morals were concerned. The boy was a neighbor, having secured the consent of the girl some four or five weeks previous.

Case 7.—Male, age 12; white; robust; of poor parentage. Was visited by me on the following day. I found a purulent discharge, evidently having existed a month or so. He, too, was obstinate, giving no information as to who had victimized him.

I do not think that the diagnosis in any one of these cases can be questioned, in the face of such evidence as has been produced in each case. To my mind, the evidence is conclusive, without any search having been made for the gonococcus. I regret that I could not have treated at least a few of them, especially as I am desirous of comparing the severity of the disease in adult and child life. I should also like to follow these cases through life,

and see what the influence of the disease is upon the organs of generation, as to whether or not the females would be sterile or would have inflammatory changes in the tubes or ovaries. Although I have no especial reason for making the statement, I believe that the virulency of both syphilis and gonorrhea is mitigated in childhood. I mean, of course, if the same rules governing treatment in adult life are carried out. I also believe that the primary and secondary manifestations of each are very much lessened as to time. The fever will perhaps be higher, as is the case with most all diseases of childhood. My experience would teach me, that it is an almost absolute impossibility to discipline such patients and prolong their treatment. One reason may be in the fact, that the parents desire to conceal the fact, and at the same time are ignorant of the ravages produced by the disease. It is to be noticed in the history of these cases, that the parents are all poor and the children were allowed to be on the streets, ad libitum. As there is very little written, bearing directly upon the subject of primary syphilis and gonorrhea in childhood, I feel that this report is justified by the hope that it may encourage reports of observations pertaining to this subject.

CHOLERA INFANTUM—ITS TREATMENT IN MALARIAL LOCALITIES.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY J. SCHNECK, M.D.

MT. CARMEL, ILL.

The application of the term, cholera infantum, is so various, both in the medical profession and by the laity, that it will be necessary for me to define the term as I wish it to be understood in this paper. By it I have reference to a disease of early childhood, in which there is exalted excitability of the nerve centers and of their meninges caused by continuous high atmospheric temperature, producing high fever and causing sudden attacks of forced vomiting and frequent, copious, liquid purging; which if not controlled results in exhaustion and death in a short space of time. The disease is most common from the sixth month to the end of the third year of life. It may occur in the midst of perfect health in a well nourished and well fed child, or it may be preceded by symptoms of cerebro-spinal irritation, or it may occur during a preëxisting diarrhea. In malarial localities it not rarely succeeds a regular paroxysm of intermittent fever, when this occurs during a time of protracted and continuous high atmospheric temperature. In my experience the symptoms which are usually the first to manifest themselves are increased restlessness with more or less dilatation of the pupils. The eyes have a bright, staring appearance, yet do not appear to see, or the mind does not seem to comprehend clearly. I have in some cases found this symptom present for twenty-four hours before the disease became fully developed. But usually with, or soon following these symptoms, there occur vomiting and purging; first of such food as may be in the alimentary canal. These first discharges are usually decidedly acid in reaction and have a peculiarly offensive mycotic odor, especially the dejecta. As the disease progresses the discharges become more liquid; the stools lose their peculiar odor and are watery and alkalin in reaction. When the disease becomes well established, vomiting and purging often occur at the same time; these are violent and sudden and are frequently accompanied by a sharp cry, as if produced by a spasmodic contraction of the whole alimentary canal. There is great restlessness, unquenchable thirst, suppression or diminution of urine; high temperature, usually from the beginning, in some cases going beyond 107 degrees F., shortly before death. Usually the flexor muscles are contracted, the thumbs fixed to the palms, the fingers clenched over them, the elbows and knees flexed and rigid; the muscles of the neck and trunk are often stiff and the head drawn to one side; pulse 150 to 200, extremities cold, fontanelles and sutures sunken, features collapsed, convulsions, coma and death. The duration of the disease in severe cases is usually from four to seventy-two hours.

My field of labor is in the southeastern part of Illinois, on the Wabash river, a region of country that is noted for hot nights as well as hot days (it being too far north to receive any effect from the Gulf breezes and too far south to be reached by the cool winds from the North and the Lake region, which occur during the evenings and nights in those quarters). Our nights are usually calm and exceedingly hot, there being much less atmospheric disturbance during the night than during the daytime.

Above, I have given a very brief sketch of a scene that has been only too familiar to me during the past twenty-two years in times of continuous high temperature. There is no class of cases that I visit with so much dread as I do one of these little patients. None of the authors whom I have consulted appear to recognize the disturbance of the nerve centers as the initial lesion of this disease; while in my experience it is usually the first and most prominent. In many cases the symptoms of cerebro-spinal congestion are so violent and rapid that the characteristic watery discharges are not a prominent feature until near the approach of death. This, I believe, is largely due to the greater amount of malarial infection of the system, in many regions.

I believe the primary cause of cholera infantum is continuous high summer heat persisting both day and night. Teething, indigestion, malaria and unsanitary conditions are responsible only in so far as they lower the vitality of the system. In cities, where the houses are built close together, a comparatively small proportion of the heat absorbed on a long hot day is lost by radiation during a short but cooler night, so that the inmates experience a continuous high temperature. I have never seen one of these cases occur in the country, except after there had been several successive days of continuous heat, varying from 90 to 100 degrees F. in the daytime and from 75 to 90 degrees F. at night. This condition we are liable to experience during the first weeks of June, or rarely the last days of May, and may continue to recur at intervals until the cooler nights of August come to our relief. It requires only one or two cool days, when this class of cases will cease to occur.

I think many of our authorities place too much stress on improper diet and feeding as primary causes, while they fail to give continuous high heat its proper prominence. I have frequently seen babies who were in perfect health and were taking nourishment from healthy breasts, taken suddenly and violently; but only in continuous hot weather.

The secondary causes are indigestion and fermentation of the food contents of the alimentary canal; including the decomposition of the natural secretions and excretions of the digestive tract, which occurs when digestion is checked. Malaria also acts as a secondary cause, as it predisposes the system to congestion, especially of the cerebro-spinal system. Filthy and unsanitary surroundings are also potent predisposing causes.

The preventive treatment should consist in physical and mental quiet; keep the body as cool as possible during the time of greatest heat. Many of the cases that I have seen were precipitated by exposure in the hot sun, often over a rough road in a wagon or buggy; or what is still worse, in a baby buggy. I know of no more severe test of a baby's endurance than to huddle it down among the clothing and covers in a baby buggy, then trundle it over rough streets and pavements, on a hot summer day. I am sure that more than one half of my cases have had this or some similar experience shortly before the onset of the disease. A hot show day is a typical occasion, and almost invariably gives us several of these cases before midnight.

The food should be pure and easily assimilated. Digestion should be aided artificially if necessary, and the slightest diarrhea should be treated very carefully and thoroughly. To accomplish this end I have had very satisfactory results with:

℞. Bismuth salicylate . . . . . .
Lactopeptin āā . . . . . gr. iii—v.
This to be repeated every two to four hours.

Remove thoroughly all unsanitary conditions; counteract malarial influences with large doses of quinin. If it is not retained by the stomach, the following should be applied over the abdomen and spine every second hour:

℞. Quin. sul . . . . . gr. xxx.
Spir. frumenti . . . . . ℥i.
Acid sul. . . . . gtt iii.
Oleum olivæ q. s. ad . . . . . ℥ii.
Mix.

If there are evidences of abnormal irritability of the nerve centers, I give from one to five drops of the fluid extract of physostigma venonosum, combined with proper doses of bromid of potassium, every one to three hours, until these symptoms are relieved; then continue as required from two to four times daily. I feel confident that many cases can be prevented by carefully and thoroughly carrying out the above indicated treatment. In severe cases when the disease is well established, especially after vomiting and purging have commenced, assimilation is often very slight or even totally absent; hence our efforts at treatment must be directed principally at the surface of the body. In such cases I place the little patient on a rubber bag which has been filled with cold, or if the fever is high, iced water. The bag should be long enough to reach from the top of the head to below the waist. The head should be elevated as much as is compatible with comfort. Inhibit exalted nerve action and tone up the paralyzed vaso-motor nerves of the internal blood vessels by frequently repeated doses of physostigma and bromid of potassium, until their physiologic effects are produced. In older children I have seen much benefit result from the hypodermatic use of morphin, but it is necessary to give it very cautiously, especially after the disease is well advanced and is approaching the stage of coma. Enemas of cold water have proven, in my experience, to be objectionable and injurious; the temporary diminution of temperature is usually followed by relaxation and increase of the serous discharges in the alimentary canal. To control the vomiting I have found nothing equal to the following:

℞. Mor, sul. . . . . gr. ii.
Carbol. acid. . . . . gtt. ii.
Aqua . . . . . ℥iv.
Mix. Sig. One teaspoonful every half hour as long as vomiting continues.

One drop doses of a mixture of equal parts of tincture iodin and carbolic acid, given in cold water and frequently repeated, is also a valuable remedy.

To allay the intense thirst and reduce the internal heat, I have found great benefit from frequently repeated, but small quantities of egg-water, made by stirring the white of a fresh egg in a half glass of cold barley water, or simply cold water with a few grains of salt or some brandy in it. Crushed ice put in a cloth and held in the mouth is also very grateful.

When, or before, the extremities commence to get cold, I apply large mustard draughts to all four extremities; first enveloping the fore-arms and legs from the wrists to the elbows and from the ankles to the knees until they are red; then the arms and thighs, extending from the elbows to the shoulders and from the knees to the hips. This should be continued until the skin over the extremities is thoroughly red from the effects of the remedy, after which it is only to be repeated when the redness begins to disappear. I consider this a most efficient means of relieving central congestion, and from abundant experience I feel I can not commend it too freely.

In addition to the above treatment, I endeavor to stimulate the secretions by giving small doses of calomel combined with bicarbonate of soda or prepared chalk, repeated every two hours. When there is time to do so I endeavor to disinfect the alimentary canal and control fermentation with antiseptic remedies. Of this class of agents I have employed bichlorid of mercury, peroxid of hydrogen, arsenite of copper, thymol, salol and listerin, but with indifferent and doubtful results. They are of more value after reaction has been established and the case has assumed the character of an entero-colitis, which it will most surely do if the child recovers from the first severe attack. In these cases it is necessary to continue the use of quinin freely. If it can not be retained when taken internally, it should be used by inunction as recommended in preventive treatment. To control the persistent diarrhea, I have found no remedy so efficient as pulverized gum opium combined with salicylate of bismuth, and I have frequently been surprised to find how much opium these little patients required, and how well they bear its use in large doses for many days together.

DENTITION, AND SOME OF ITS DISEASES.

Read in the Section on Diseases of Children, at the Forty-fourth Annual Meeting of the American Medical Association.

BY MARION THRASHER, M.D.

SAN FRANCISCO, CAL.

Normal dentition is comparatively harmless. The teething in wild animals and barbarous nations is usually attended with no danger, and with but little

inconvenience. The young, however, of beasts confined in cages, rarely live during the period of teething.

In our age of civilized refinement, abnormal dentition is the rule. So deadly has it become, that one-third of the human family die before the twenty deciduous teeth have fully appeared. Its danger is constantly increasing. A few decades ago, when the practice of mothers nursing their children was more in vogue, the fatality was not nearly so great. Latterly it has become unfashionable, and children are fed on artificial food, and the result is an alarming mortality. Dentition in these children develops incidentally many diseases. The commonest are irritative fever, indigestion — with its attendant evils, flatulency, constipation and diarrhea—cerebral convulsions, stomatitis, capillary bronchitis and pneumonia. Practically, it is almost impossible to, at times, segregate the foregoing diseases. Clinically one, or most of them may be present, in the cutting of a single tooth. Irritative fever is the most frequent. The gums, irritated by the advancing tooth, generate a poisonous mucus, the salivary glands become abnormally active, and a rise in temperature appears. This saliva is swallowed, and interferes with the digestion of food, that otherwise even would be difficult to assimilate. Flatulency, constipation, or its opposite, diarrhea, are evils now present. This, now poisonous ingesta, may produce, through reflex sympathy, cerebral convulsions.

In childhood, the nervous system so preponderates that any irritant will readily disturb the delicately balanced equipoise. Adults, with nerves trained to pain and suffering, know how toothache will derange the entire nerve system, and even increase a degree or two the body temperature.

The infantile tooth gradually rising through the gums, producing continuous tension, develops varied forms of constitutional, as well as local disturbances. The mucous membrane becomes red, hot, swollen and tender. The saliva is greatly increased, and the itching over the protruding tooth is so annoying that to allay it the child tries to bite everything that comes in its way. A nervous or irritative fever now appears. The temperature will often rise to 104 or even 105 degrees, when eclampsia may come on. Though "teething convulsions" have been denied by a few modern medical writers, yet their existence has so often been corroborated by clinical experience, their etiology can not be gainsaid. During the coma of these convulsions, capillary bronchitis may arise as a complication, and when it does it is often fatal.

Purulent conjunctivitis has often been found during the time the upper canine teeth are being cut. In this case, inflammatory action is transmitted through the antrum of Highmore. During dentition, eclampsia is very common, as well as fatal, in the children of drunkards, who also are more liable to gingivitis, and the different forms of stomatitis.

Coughs often accompany the appearance of the upper teeth, which resist medical treatment until after the teeth have fully appeared. Exanthemata, especially eczema impetiginosum, may occur at this period, which stubbornly resist treatment—and fortunately they do, for if cured, dangerous cerebral complications would present themselves, the skin disease forming as it were a safety valve.

During the teeth evolution, the sub-maxillary glands are often swollen, and I have often seen the cervical glands enlarged and suppurating, especially in children of scrofulous or rachitic parentage.

The treatment for all these diseases should be anticipated, and prophylactic. The time-worn saw of "an ounce of prevention" is especially applicable here. Dentition is a dangerous period in a child's life, and should be jealously watched by mother and physician. Conditions, hygienic and dietetic, should be most propitious.

Every unfavorable complication should be met at the threshold, and if possible mastered. Diarrhea, so common, is a safeguard in expelling from the system morbid material, and should not suddenly be checked. Paregoric, so usually administered by the laity at this time, often works irremediable mischief in the stoppage of the flux which nature has wisely instituted for the benefit of the child. Should it become chronic and weakening, it then should receive the physician's attention. Usually, minute doses of hydrargyrum cum creta, bicarbonate of soda, and tannin for a day or two, followed by oil, will rectify the trouble. Excessive temperature should at once be controlled by baths, lessening the food, enemas, and aconite. Cutaneous affections should receive no attention during this period. Capillary bronchitis, pneumonia, and other diseases of the respiratory organs, should be treated as indicated, but prevented if possible. Restlessness can often be overcome by hot baths, with aconite and the bromids. If the tooth is just breaking through the gums, lancing it will often afford prompt relief. Delayed dentition in young children may be remedied by vigorous constitutional treatment of pure air, wholesome food, bathing, cod-liver oil and citrate of iron and quinin.

THE TREATMENT OF DIPHTHERIA.

Read before the Camden County (N. J.) Medical Society.

BY E. L. B. GODFREY, A.M., M.D.

PHYSICIAN TO COOPER HOSPITAL; LECTURER ON MEDICAL NURSING IN NEW JERSEY TRAINING SCHOOL FOR NURSES.

CAMDEN, NEW JERSEY.

I desire to call your attention, as announced in the program, to the treatment of diphtheria. The subject is full of interest, not alone from the past and present prevalence of the disease, but from the startling fact that, despite the great advancement in sanitary science, diphtheria is more continuously present than any of the acute, contagious diseases. Further than this, it can be said that diphtheria, despite sanitary science, has steadily advanced, and, for several years past, has maintained the character of an epidemic, in this section of the country. I shall speak from the standpoint that diphtheria is primarily a local disease; that systemic infection is secondary to the local invasion, and beg to call your attention to the hygienic treatment, the medical treatment and the preventive treatment.

THE HYGIENIC TREATMENT.

In the hygienic treatment, the selection and care of the sick-room and the care of the patient, as regards the toilet, are matters of prime importance. Neglect in these particulars means danger of re infection and the further spread of the disease. The sick-room should be selected in reference to its air-space, its exposure to sunlight, its ventilation and the isolation of the patient. The care of the room is

equally important. All unnecessary furniture should be removed to obviate the need of keeping it clean and of disinfecting it after the termination of the disease. Dust should be banished from the sick-room, because it irritates the throat and affords a medium in which the poison thrives. Cleanliness during the progress of the disease, and the disinfection of the premises after its termination constitute, in the main, the duties of the nurse-attendant. However trite this may seem, it is so rarely carried out, that it will bear iteration and re-iteration until every patient knows its worth. None of the infectious diseases require greater cleanliness, or more thorough disinfection for their stamping out, than diphtheria. The temperature of the room should be kept at 68 degrees, and continuously moistened with steam, medicated with turpentine, thymol, or eucalyptol, etc., especially so if laryngeal invasion has taken place, when the temperature should be both warm and moist.

Care of the patient's toilet, and frequent changes of bed clothing are needed, on account of the liability of their becoming soiled with sputa, and the salivary and pharyngeal secretions, which contain the virus of the disease. This is not extensively diffused in the room but attaches itself to the clothing, bedding and the sick-room appliances. All soiled clothing should, therefore, be disinfected with boiling water before being removed from the room. These points are not insignificant; their observance will not only mark the difference (when the disease is treated from its initial stage) between a short or long continued case, but the difference between the limitation of the disease to one in the household or the infection of others. The confinement of the patient to the bed, as well as cleanliness in the toilet, is a matter of moment. This should be done during the progress of the disease, and for a considerable time after convalescence is established. Three weeks is not too great a time for the confinement of a case of ordinary severity. I make confinement in the bed an imperative rule, so long as there is noticed disturbed rhythm in the action of the heart. Rest in bed tends to ward off renal complications and paralysis, which are the most important sequelæ. Paralysis takes place, as a rule, during or after the establishment of convalescence and may follow a mild case. It is claimed to be due to absorption of the ptomaines or the poisonous products of the specific bacteria, and is regarded as a toxic neuritis with degenerative changes of the nerve tissue. This accounts for the great exhaustion, the tendency to paralysis and for the extraordinary slowness of the recuperating process. Even after apparent recovery, paralysis, either local or general, may supervene, so slowly does nerve tissue regain its power. Its tendency to paralyze the heart, through inflammation of the cardiac nerves, makes the disease one of constant dread. Sudden exertion contributes to heart paralysis, when degenerative changes have taken place in the cardiac nerves or in the structure of the heart. Rest in bed, therefore, should be insisted upon until health is practically regained.

THE MEDICINAL TREATMENT.

The medicinal treatment of diphtheria, though far from satisfactory as the variety of treatments in vogue indicates, is not so much a matter of speculation as formerly, since the bacterian origin of the disease has been established. The bacillus of Klebs-Löffler is now claimed, by our best authorities, to be the exciting cause. Experimentation has shown that cultures of these bacilli inoculated into the larynx of animals will cause diphtheritic exudation with necrosis of tissue, and that the injection of their ptomaines into the blood will cause paralysis allied to that belonging to diphtheria. From this relationship of cause and effect and with these premises admitted, the conclusion is irresistible that diphtheria is the result of their activity within the throat. Still it is claimed that the bacilli are not found in the blood even during the period of systemic infection, but are found, in connection with other bacteria, in the diphtheritic exudation. These germs, coming in contact with the mucous membrane of the throat, excite inflammation, destroy the cells of the superficial epithelium, which destruction constitutes the false membrane. This, for a time, is so closely adherent to the underlying structures as to prevent the poisonous products of the bacteria from being absorbed, unless the membrane of the throat is in an inflamed or ulcerated state, when systemic infection is frequently first observed. Following the state of inflammation, cell destruction and the formation of false membrane, there follows a condition of suppuration, tissue necrosis, detachment and abrasion, during which the toxic products of the bacteria are absorbed by both lymphatics and blood vessels and the system consequently contaminated. Believing this, the medical treatment of diphtheria will be presented from both a local and constitutional standpoint, but only in so far as the treatment relates to cases under my care at the present time.

THE LOCAL TREATMENT.

The local treatment should be directed to the arrest of the development of the Klebs-Löffler bacilli. This can best be done by thorough cleanliness and thorough disinfection of the nose, mouth and throat, since the membrane in the early stage of the disease can not be removed. Forcible detachment of the membrane is condemned, because it affords both an easy ingress for the virus and makes applications painful to endure. Thorough cleanliness, however, of the nose, mouth and throat is imperative. Broken down tissue, mucous accumulations and sordes must not be allowed to accumulate. Free expectoration should be encouraged and the sputa receptacle kept filled with a disinfecting solution. For cleansing the teeth, mouth and throat, vinegar and water, lemon juice, glycerin and water, claret wine and water or pine-apple juice and water will be found of advantage, both on account of their being palatable, and because of their tendency to arrest, from their acid nature, the development of the germs. Thorough and repeated disinfection of the mouth is required in addition to cleanliness, and under no circumstances should the nose be neglected in either of these particulars.

For the treatment of the throat, the gargle, the spray and the swab, insufflation, inhalations and ice are used. The gargle does not affect the posterior part of the throat and, if pain is caused by throwing the head backward, is discontinued. The spray is repeatedly used, and corrosive sublimate dissolved in fluid extract of pinus canadensis, glycerin and listerin has proven the most satisfactory,

although the sulpho-carbolate of zinc dissolved in glycerin and listerin, and the peroxid of hydrogen, glycerin and water have given good results. The swab, made of absorbent cotton, affords the best service. By this method of direct application, every part of the throat can be reached, and upon it rests largely the success or failure of the local treatment. A combination of corrosive sublimate, cocain, Monsel's solution and glycerin is my chief reliance. Occasionally, I employ salicylic acid, glycerin and alcohol, or the nitrate of silver, or peroxid of hydrogen and glycerin. For insufflating, when this can best be done, calomel is used; after the membrane has become detached, leaving an abraded surface, aristol and boracic acid are employed. For inhalations, medicated steam is used of which I shall speak later. The use of ice is encouraged for the double purpose of allaying thirst and reducing congestion. Its application to the neck has been abandoned for warm or hot applications, especially during the process of sloughing of the membrane. As an application to the enlarged and painful glands, ichthyol and lanolin, or hot medicated flannels are used.

If it is true that diphtheria is due to the activity of specific germs, then the importance of local treatment is admitted. If admitted, then the treatment should be directed to arresting the development of the germ. To accomplish this, the anti-bacterian solution must be placed in direct contact with the germs. The success of the treatment, therefore, depends upon its thoroughness, and the accomplishment of the object sought. This requires patience, skill and courage. But when applied with this definite object, at least every hour of the first day, the disease will be cut short in its death-dealing progress. The disease makes rapid inroads. The child should be awakened for local treatment, because local treatment is more important than sleep. It will be observed the cleaner the throat is kept, the milder will be the disease.

THE CONSTITUTIONAL TREATMENT.

The object to be accomplished by the constitutional treatment is to combat the effects upon the system of the toxic absorption from the throat. This, excluding the sequelæ of paralysis, bears a definite proportion to the throat deposit. It consists chiefly, as has been stated, of a toxic neuritis, with impoverished blood, etc. To combat its effects, there is no specific remedy. To place the patient under the best sanitary environments; to regulate the secretions and to maintain the strength by regular feeding and tonic remedies is the object to be attained. For this, a combination of corrosive sublimate and tincture of the chlorid of iron is first employed. The corrosive sublimate is pushed almost to its toxic effects, but is withdrawn if symptoms of gastro-enteritis present themselves. It has not given me the satisfaction in diphtheria that has attended its administration in scarlet fever. As soon as the necrotic condition appears within the throat, a combination of the chlorate of potassium and Basham's mixture is given. Basham's mixture is more easily absorbed than the tincture of chlorid of iron, and proves of better service in stimulating the function of the kidneys. The depressing effect of the chlorid of potassium upon the heart must not be forgotten. The condition of the heart should always receive attention. The danger of heart paralysis from neuritis of the cardiac nerves or from endocarditis is always present, especially during convalescence. The least disturbance in its rhythm, or the first appearance of a slow or a rapid pulse, calls for special treatment. Strychnia, or the tincture of nux vomica, digitalis and stimulation are employed according to the condition of the heart's action.

Regular feeding, during the day and night, is very important, because diphtheria, more than any of the acute diseases, tends to exhaustion. In difficult deglutition or continued nausea, nutritive enemata are resorted too. The food is given hot, and in liquid form. Milk should be the basis, and to vary the taste, which is an important item, may be given in coffee, tea, cocoa, wine, oyster juice, clam juice, with vanilla, nutmeg, or eggs, or in the form of whey, junket, gruels, custards, etc. If curds are vomited, peptonize the milk; beef juice and beef pulp should also be given.

For laryngeal invasion, steam inhalations are given. The steam is medicated with turpentine, eucalyptol or carbolic acid, introduced into a tent under which the patient is continuously kept. Calomel is given internally with stimulants; vomiting is early induced and if dyspnea is not relieved, intubation or tracheotomy are recommended.

For nasal complication, indicated either by the odor or the discharge from the nostrils, the nostrils are syringed every half hour or hour with a warm solution of corrosive sublimate.

THE PREVENTIVE TREATMENT.

The importance of this treatment will be admitted when I tell you that 2,624 cases of diphtheria were reported to the Board of Health of Philadelphia, from January 1 to October 28, 1893, with 750 deaths, making a death-rate of 28½ per cent. During the same period, in Camden, 220 cases were reported to the Health Board with 56 deaths, making a death-rate of 25½ per cent. These are startling figures and prove that the principles of preventive medicine are not practiced to any great extent by physicians or executed by public health officials. Were cholera or small-pox present in either city to the extent that diphtheria prevails, both cities "would be up in arms."

To subdue the disease, isolation and disinfection must be insisted upon. These principles, as they relate to the patient, have been considered. Equally important is it that disinfection be applied to the premises. To insure the practice of isolation, cleanliness and disinfection in diphtheria, the people must be educated to the fact that the virus of diphtheria does not come from the breath of the patient, but from the sputa, the salivary and the laryngeal secretions; that the virus possesses the powers of life and development; and that it attaches itself to clothing and furniture, and in order to destroy it, the disinfectant must come in absolute contact with it and must be of such a nature as to destroy life. This education is the province of health officials, and if made a part of the policy of boards of health, the prevalence of diphtheria will be materially checked.

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THE CURABILITY OF NASO-MUCOSITIS.[1]

BY THOS. F. RUMBOLD, M.D.
SAN FRANCISCO, CAL.

(*Concluded from page 888*).

PART III.

Dissatisfied Patients.—There are two classes of patients who visit a physician for consultation, with regard to suspected or painful disease of the upper air passages, that are almost certain to be dissatisfied with the promises given them: one, those who expect to be cured in a few weeks at most; the other, those who have come to the conclusion, because of many disappointments, that the disease can not be cured.

The First Visit to a Physician.—Take an individual of the first class, about thirty-nine years of age, who has had little or no painful experiences connected with the disease. He is conscious of a little more flow of secretion in the back part of the throat than he thinks should take place. He has been clearing his throat every morning for five or six years, but seldom has gagging spells with these efforts; and were it not that he has heard the subject spoken of very frequently, or has read in the newspapers of the symptoms of nasal disease quite similar to his own, he would not be any more mentally disturbed than he has been physically troubled by the presence of the flow. But all of these circumstances are sufficient to cause him to consult a physician, thinking that he will very quickly be completely cured. When informed that his complaint is a chronic one, consequently it has been progressing so painlessly that he has been entirely unconscious of the injurious and comparatively permanent changes that have taken place in the blood vessels and nerves, as well as in the mucous membrane of his nasal passages, and that it will take a rather long course of treatment before the recuperative powers of his system can repair the damages thus insensibly produced, he is surprised. He can not understand why it is that it takes so long to cure a painless and almost sensationless disease. When informed, as he should be, that the blood vessels of the nasal passages were so slowly enlarged that no pain was produced, though the inflammation was injurious, nevertheless, and that so long as the inflammation exists, these injurious effects will continue to increase; also that this slow process can not be eradicated except by slow degrees, he will still remain unconvinced, unless he has confidence in the physician. He may, however, be so favorably impressed with these statements as to place himself under the physician's care.

Many times it is difficult to control such a patient in regard to hygiene; and the more ignorant he is as respects the laws of health, the less is he controlled, especially if he has contracted any bad habits—as have the great majority of such persons—such as the use of tobacco or stimulants. As he has had little or no pain of which to be relieved, he will feel but slight change as a result of the local applications used by his physician, unless he is cognizant of the decrease of the flow of secretion in the nasal passages and throat, and observes that he is *not taking cold* as frequently nor to so severe a degree as formerly. If these two important evidences of improvement are not observed and do not produce a decidedly favorable impression upon his mind, the continued restraint in regard to his habits will be almost certain to cause him to discontinue medical treatment. If he does discontinue treatment, in a few months he will find himself taking cold far more frequently and in a severer degree than formerly. Having heard some of his friends recommend one of the latest "catarrh cures," advertised in the newspapers and shown in the drug store windows, he may expend a few dollars for it. This "cure" may give him a little relief for a short time. Then he will find to his sorrow that the "thing is doing more harm than good."[6] He now discontinues his self-treatment and finds that his air passages are more comfortable without the much advertised "cure."

With the next change of the season, either spring or fall, he is made certain, by frequent and severe colds, that he has nasal disease of a painful form. He may now visit one of the many advertising men who promise a cure for a small sum paid monthly. These trials will consume about six months' time, when in disgust he will try the virtues of a change of climate. Usually the wily advertising man suggests this course to get rid of a troublesome customer. It makes but little difference where he goes, he will improve in health, much to his delight. The discontinuance of injurious methods of treatment and the change together being the cause thereof. In six months he takes another cold, which causes a severe cough; and for this he visits a physician who prescribes and the cough disappears. In a week or two, another but more severe cold is taken; the prescription *does not* cure the cough this time. His strength is now affected; he loses in weight; he goes to a large city and consults some one who has a reputation for curing lung troubles. He is told that his lungs are all right, but that his stomach and it may be, his liver, are out of order. If calomel—that best of all killers of microbes which now have a rich soil in his *primæ viæ*—is given in small quantities and continued for some time, he will suddenly improve greatly, showing the intimate relation between the stomach and bowels.[7] He is now thoroughly aroused and takes good care of himself, discontinues all excesses, especially tobacco and stimulants, which he is satisfied are injurious to him, and remains in comparatively good health for some months.

Overgrowths in the Nasal Passages.—At the next change of the season he takes another cold, which is so severe as to almost shut off his nasal respiration. All this time his rhinitis has been progressing painlessly. He has the nasal obstructions removed and is greatly relieved; feeling as though he had another lease on life and comfort.[8] These obstructing masses are the result of years of continued inflammation, and this inflammation will not be reduced by the mere removal of the growths. If the reduction of the inflammation is not brought about, either before this removal or afterward, one or two years at most, with no unusual exposure, are all that is required

[1] The term, "naso-mucositis," is formed from the word mucosa, the mucous membrane, with the usual termination, "itis," that indicates its inflammation, and the prefix naso-, which limits the inflammation to the nasal passage.

[6] All these "sure cures" are composed of materials that at first afford relief but afterward surely inflame the nasal passages. I have examined eighty-four of these "cures." Of these, carbolic was in sixty-four; camphor in forty-nine; and cubebs in forty-eight. All of these agents will produce a cooling and relieving effect the first few times they are used, but in a short time the injurious effects will be experienced.

[7] While the calomel will destroy the microbes in the stomach and bowels, it will not check the supply which comes from the nasal passages.

[8] These operations are essential to the permanent recovery of such a case, but after the removal, one should receive a course of local painless applications, followed by supplementary courses.

for him to again experience an impeded nasal respiration, bringing back not only the former disagreeable symptoms, but others in addition, for the operations themselves will assist by their irritation in exciting increased inflammatory action, the influence of which may extend to the brain; where it may manifest itself by the appearance of mental phenomena of various kinds.

It is chiefly because of futile efforts, as those just detailed, that many victims of nasal inflammation, and they form the *other class* of dissatisfied patients above mentioned, come to the conclusion that "the disease can not be cured." This man now belongs to the "other class," and for illustration, his case will be followed still further. He is now thoroughly convinced that nothing can cure him; he has tried everything, consulted the most renowned medical men, and yet the complaint is on him in a worse form than ever. His nasal inflammation has now extended into the ethmoidal sinuses by continuity of structure, thence into the brain by blood vessels and nerves, as demonstrated by the exhibition of such common mind troubles as the following: he is forgetful; he is cross; he can not attend to his business as formerly; he can not think consecutively; his mind flits from one subject to another; he can not even read with satisfaction. When in his office he can not hold his mind on his business long enough to attend to it, and when in his bed he can not take his mind off it; consequently he can not sleep; his appetite is poor or capricious; he loses all ambition; becomes melancholy and nervous; is fearful that his mind will become seriously affected, and as a consequence of all this he is dreadfully tired of life.

"*Nervous Prostration.*"—It is a popular thing to flatter such a person by telling him that he is suffering from mental over-work and "nervous prostration" in consequence thereof. This diagnosis has some apparent ground, for such an individual is excessively "nervous" in disposition and actions. Generally if such a person accepts the advice urged upon him by his friends, and rests his brain, he will find but temporary relief from this enforced absence from his business. No healthy man's brain work causes "nervous prostration." The very great majority of those who are supposed to be affected with this popular ailment are really suffering from *undiscovered naso-mucositic inflammation.* In such cases, the chronic disease has been twenty or more years located immediately under the anterior portion of the brain. This portion of the mental organ being intimately connected with the ethmoidal cells, by both blood vessels and nerves, must seriously affect the brain, consequently affecting the mentality of the individual. It will be useful in this place, to see how this diseased action is brought about. This we can learn by an examination of the anatomy of the nasal passages and ethmoidal cells, and see how they are connected with the brain.

Vascular Connection Between the Nasal Passages and Ethmoidal Cells and the Brain.—The cranial carotid artery gives its first branch, the ophthalmic, to the eye, and this sends two branches to the nasal cavities. The first of the latter, the posterior ethmoidal artery, passes through the posterior ethmoidal foramen, supplies the posterior ethmoidal cells, and ascending, enters the cranium, gives off a meningeal branch which supplies the adjacent dura mater, then descends and again enters the nose through an aperture in the cribriform plate and is distributed to the superior turbinate processes. The anterior ethmoidal artery, also a branch of the ophthalmic, passes through the anterior ethmoidal foramen, supplies the anterior ethmoidal sinuses and, entering the cranium, divides into a meningeal branch, which supplies the adjacent dura mater, and a nasal branch, which descends and again enters the nose through an aperture in the cribriform plate, and is distributed to the middle turbinate processes. It is seen that the anterior portion of the meninges are stitched, as it were, by these arteries to the upper portion of the nasal passages, giving an excellent opportunity for the transference of diseased action from the nasal passages and ethmoidal cells to the brain; and experience proves that such is frequently the case, as in the case of "nervous prostration" above mentioned.

Relieve the naso-mucositis, and the "nervous prostration" occasioned by the transference of the nasal and ethmoidal disease to the brain, will be relieved also. Instead of calling the ailment, "nervous prostration," it should be called a *mental and physical debility*, for such is the condition of the patient.

In relieving the nasal and ethmoidal trouble, the stomach is relieved of the continual unconscious flow of disease-producing, muco-purulent secretion that is passing into it day and night from the pharyngo-nasal cavity, which in turn occasions indigestion and in this way *physical debility.* The relief of the nasal and ethmoidal inflammation also relieves the secondary or brain trouble which occasions the *mental debility.* That the exercise of the brain is exhausting to such a person is apparent, but this is not from mental over-work *per se*, but because this organ is weakened by the nasal disease, whose seat is located immediately under it. Remove this inflammation, and he can perform severe brain work, not only without exhaustion but with pleasure, just as the healthy muscular man performs physical labor with pleasure.

This course is but rarely pursued. The victim of so-called "nervous prostration" usually visits some of the popular springs in this country or in Europe, and experiences a little relief, but this is the most. Such a person, having lost almost all confidence in medical men, rarely visits a physician of his own motion. He is usually urged to consult some one, or is taken there by a friend. His story is a long, wearying one. It appears as though it was his effort or aim to prove that he can not be cured by any means or method.

Despair of Being Cured.—He is exactly in the opposite state of mind from what he was in at his first visit to his physician, at which time he thought that his painless disease should be cured in a few months at most, and was astonished when informed that it would take "three or four years" of supplementary courses, before he could be permanently cured. He has now wasted three or four years in the use of what he thought was as good, and certainly very much cheaper means of cure. Consequently, he is in a far worse condition than when he first consulted the physician, instead of being perfectly well, as he could have been.

Can such an individual be so treated that he will lose all of these most distressing symptoms? Yes, but they will not all disappear at once, nor any of them in a short time. It will take a greater number of treatments than when he first presented himself;

improvement will take place during the first few weeks more rapidly than afterward, for the reason that many of his most disagreeable symptoms are due to acute inflammation, which yields in a comparatively short time to local and constitutional treatment, but the chronic inflammation, which means enlarged blood vessels of the nasal passages and brain, diminished function of the mucous glands of the nose and stomach, and perverted action of many of the nerves of these health controlling organs, yields only after several months of preliminary treatment followed by several years of supplementary courses.

"Years?" says some one. Yes, is not this far preferable to *never?* Is not even very slow improvement far better than slow increase of disease, as well as the increase of the severity of its many mental sequelæ?

RECURRENCES.

"Will the catarrh return after I am cured?" That is a very proper question and is nearly always asked by patients. A fretful medical man, fretful because he may be himself a victim of reflex naso mucositis, might answer by asking the following questions: "Is it possible for me to treat you for a fractured arm so that you could not break it again? Could I cure you of a burn so that you could not burn yourself again? Can I treat you for a cold, and its effects on the mucous membrane, so that you could not take another cold if you tried to do so? In other words, can I cure you so that you could not expose yourself again? Or shall I rather try to cure you of your habits of exposing yourself to colds and other irritating influences?"

While these answers are in every respect answers to the patient's questions, yet they do not give enough information, such as to teach him how to prevent the return of the disease, a matter of very great importance to him.

Here are the answers I almost invariably give:

1. "Yes, the disease will be certain to return if you continue your former careless habits of life, using no precautions to prevent taking cold, and if you continue to use tobacco and stimulants, and be indifferent in regard to clothing; that is, if you are not cured of the customs and habits that induced the disease, showing the return of the disease will be entirely due to your own fault."

2. "No, the nasal trouble will not, or more properly can not, return if you live consistently with the laws of health. How is it possible for it to return if proper care is taken?

"To prepare a person so that he will be affected with chronic naso-mucositis, one must expose him for a number of years so that he will take numberless colds, or must cause him to commit excesses for many years. I challenge any one to produce, as it were, a case of chronic nasal disease in any other way.

"After one is cured of chronic naso-mucositis, the disease can not return unless the patient again commits the same acts that produced it. Being cured, the mucous membrane of the nasal passages is in as healthy a condition as that of the mouth or eye. It is in the diseased eye and the diseased nasal passages that cold is taken. An eye in a normal condition will not be affected by colds, neither will a normal, that is, a cured nasal passage. One will take a cold in a fractured arm before, not after recovery.

"If one has been treated for several months, and continues to take cold, even when he is doing the utmost to prevent it, this proves that *he has not been cured;* for a cured person will not take cold, unless greatly exposed, and that for a number of weeks and may be months.

"No person, after once undergoing a course of treatment for naso-mucositis, should ever again experience symptoms as severe as he had previously to being treated. In fact, he should have no nasal trouble at all. If he does, and is fairly well-informed, it is his own fault and he knows it and does not care to change his course of life to prevent it."

It is certainly a very proper as well as a very reasonable request to make of patients, that they will strictly observe the conditions of health, as they would if suffering from any other disease; that is, that they use their utmost endeavors to prevent a renewal of the causes of the disease.

Is this possible? Yes, always possible. It is not because of the inability of patients to discontinue the disease-producing habits and customs, or to conform to conditions that will assist in bringing about a recovery, that the disease returns. Many times it is on account of ignorance and many times because of the strong hold that these customs and habits have upon them.

What can be Promised.—As a general rule, if the patient with uncomplicated naso-mucositic inflammation, who is under fifty-five years of age, will take care of himself and receive a perfectly non-irritating local treatment, and suitable constitutional treatment, he will recover entirely. He will notice an alleviation of all the acute symptoms immediately after he commenced treatment; usually a patient under thirty-five years of age notices an alleviation and on the first day. With every grade, all violent symptoms disappear permanently in a few weeks, at the farthest. If the patient continues to observe the laws of health and receive the supplementary courses upon the completion of his *first course*, he will in a few years, at farthest, lose all tendency to a recurrence of the disease. The mucous membrane of the nasal passages, throat and ears will have regained its normal resisting power so that usual exposures will not result in colds as formerly. Such a patient may, once in a year or so, take a little cold in the head, *but only upon unusual exposure.* These colds will not be nearly so severe nor last so long as those formerly contracted. Should one or two local treatments and suitable constitutional treatment be received, every vestige of inflammation will quickly disappear, not to return until the patient again unusually exposes himself.

During this time and after this time such a person's life will not be disturbed by any disagreeable physical or mental symptoms as formerly; in other words, *he will be in a healthy condition.* A grand result, indeed a result, I am sure, that means many additional years of life. Being in health, if he lives in obedience to the laws of health, of which he should not be ignorant, he will remain healthy. His continued health will be the great reward of his small services to the goddess Hygeia—a goddess who never allows her devotees to go unrewarded.

Those patients of the fifth grade, who are over fifty-five years of age, will also be almost as quickly relieved of all painful symptoms as those of the fourth grade, but they will require a few treatments

each fall and spring during life to maintain them in continuous relief, although as already stated, a great many in this grade do pass one or two, or more, years without requiring a treatment. If the great pathologic changes that have been taking place during many years are kept in mind, I am sure no complaint would be expressed at the incompleteness of the cure, especially so when the patient is experiencing relief all the time that he is taking the supplementary courses, and really feels, not only entirely free from disagreeable symptoms, but would coincide with his physician, were the latter to assert that the complaint was completely cured.

THE TORSION OF ARTERIES FOR THE ARREST OF HEMORRHAGE.

Read in the Section on Railway Surgery, at the First Pan-American Medical Congress, Washington, D.C., Sept. 6, 1893.

BY J. B. MURDOCH, M.D.

PITTSBURG, PA.

To the members of the National Association of Railway Surgeons who were present at the meeting held at St. Louis in May, 1889, this paper will contain little that is new. The interest taken in the subject at that time was so great, and the discussion which it elicited so animated, that I am encouraged to bring it before this larger audience of the Pan-American Congress. The subject is, in my opinion, so important that every surgeon should be familiar with it. Since the reading of the paper referred to, I have continued to practice and to teach this method of controlling the hemorrhage from wounded arteries and veins, and increased experience only confirms me in the value of this method as a hemostatic. What I shall now say is a reiteration of what I have already said, with the addition of a later and larger experience.

There is no subject of greater interest to the practical surgeon than the arrest of hemorrhage. This remark is equally true, whether the hemorrhage comes from a wound accidentally inflicted or made intentionally by the surgeon's knife. Without the means of stopping the flow of blood from bleeding vessels the surgeon's art would be greatly crippled, and surgical operations where blood vessels must be divided would be impossible. There is no sight so appalling as a formidable hemorrhage. When a large artery is opened the blood gushes out in an angry stream, the face becomes pale, the color leaves the lips, the respiration becomes sighing, the heart fails to beat, and death soon closes the scene. Surgeons from the earliest ages have shared with the people this dread of hemorrhage, and have ever been striving for the best means for its control. Upon no subject has our profession been more conservative than upon this one, the arrest of arterial hemorrhage.

Since the time of Celsus, notwithstanding the numerous methods which have been proposed for this purpose, but two, viz.: the actual cautery and the ligature, have received the indorsement of the profession. But if the profession has been slow to indorse new methods, its confidence once gained has been most unwillingly surrendered. From the time of Archigenes, who practiced in Rome shortly after the time of Celsus, up to the time of Richard Wiseman, Sergeant-Surgeon to King Charles II, the red hot iron was the sole method employed. Thus this method of checking hemorrhage after amputation not two centuries ago, was the same as that used for fifteen hundred years previous. The pertinacity with which surgeons adhered to the use of the actual cautery after Paré's great discovery of the ligature well illustrates the fear in which surgeons stood of hemorrhage. They had used, and had seen their fathers use, the red-hot iron, and, notwithstanding the pain it caused and the interference with primary union, they were unwilling to discard the agent which long usage had taught them was successful.

In 1564 Ambrose Paré published his new discovery, which, to use his own language, "was taught him by the special favor of the sacred Deity." In this publication, as is well known, Paré demonstrated the value of the ligature as a hemostatic. But, owing to the extreme fear of hemorrhage, and the criminal neglect of surgeons, it was two hundred years before it was adopted by the profession, and then it came into favor through the influence of Sharpe, one of the surgeons of Guy's Hospital, London, who boldly championed the claims of the ligature to popular confidence. Since this time nothing has dislodged the position which the ligature has held as a hemostatic in the opinion of the profession. The efforts made by Sir James Y. Simpson of Edinburgh, to substitute acupressure, and the still more recent endeavor of Dr. S. F. Spier of Brooklyn, to substitute constriction for ligation have most signally failed. The same statement may also be made in regard to torsion as a means of arresting arterial hemorrhage. It has not received the support of the profession to any great extent, but, unlike the other rivals of the ligature, it has had champions for hundreds of years, and still holds a place as a valuable means of arresting hemorrhage. The subject has received but little attention from modern surgeons. The twisting of an artery to arrest bleeding is of ancient origin. It is spoken of by Celsus. A fact often observed, that an arm or leg may be torn from the body with the loss of only a few drops of blood, no doubt suggested the method. It has been advocated by such surgeons as Amussat, Dieffenbach, Schroeder and Syme. But the credit of bringing it prominently before the profession and establishing its efficiency is due to Mr. Bryant, the late distinguished surgeon of Guy's Hospital, London. At this Hospital the ligature is seldom used, torsion being chiefly relied upon. Mr. Bryant tells us, in the last edition of his "Surgery," that in two hundred consecutive amputations of the thigh, leg, arm, and forearm all the arteries were twisted, one hundred and ten of them being the femoral artery, and that in no case was there secondary hemorrhage.

Mr. Bryant says: "The physiologic arguments in favor of torsion are very great, and the practical advantages seem to be no less. After seven years' experience in its practice, applied to vessels of all sizes, the femoral being the largest, I have had no mishap. I have observed that wounds have united more rapidly and kindly, primary union being the rule. There has been less constitutional disturbance after operation, and consequently less liability to traumatic fever, pyemia, and other complications, such as we are all too familiar with in the practice of surgery. I have had stumps heal in a week, and the patient up in two weeks, without one single drawback, rapid and uninterrupted convalescence following the operation.

That Mr. Bryant never lost his faith in the efficacy of torsion as a hemostatic, is evident, from the following letter received from him shortly after my first paper upon this subject had been published:

65 Grosvenor St., Grosvenor Square, London,
January 11, 1887.

Dear Dr. Murdoch:—I have to thank you for your *Pittsburg Medical Review* and your article on "Torsion." It is very gratifying to me to find my teaching has had such a happy influence in your country, and I trust I may not lead you into wrong ways. I adopt torsion as generally as ever, and so do most of my colleagues. The carbolic catgut ligature is only a second best. How wonderfully our art is advancing, and how we reciprocally learn from one another across the Atlantic, and thus forge permanent links of friendship and good feeling. Ever yours truly,

Thomas Bryant.

Having given this experience of Mr. Bryant, I desire now to give my own as observed at the Western Pennsylvania Hospital at Pittsburg. At this Hospital, torsion is almost exclusively relied upon to check the hemorrhage from wounded arteries or veins, whether the wound be produced by the surgeon's knife or otherwise. My experience with torsion as a hemostatic, dates back to the year 1872, when I became a member of the Hospital staff. My colleagues had, previous to my connection with the Hospital, been twisting arteries as large as the radial and ulnar. The facility with which this was done, and the fact that the wounds healed kindly and without secondary hemorrhage, induced me to follow their example, at first timidly; but with success came confidence. Having been successful in the amputation of a forearm with no untoward result, I ventured next to twist the brachial after the amputation of an arm; soon after this, the axillary, and then the popliteal, and finally the femoral. And now, for the past twenty-one years, torsion for the arrest of hemorrhage after all surgical operations, has been the recognized and almost the only method resorted to at this Hospital. It is to be regretted that records have not been kept of the number of large arteries which have been twisted to arrest the hemorrhage.

The following is a table showing the number of arteries divided in cases of amputation, where torsion has been resorted to for the arrest of hemorrhage at the Western Pennsylvania Hospital, Pittsburg:

Femoral	160	times
Popliteal	24	"
Axillary	24	"
Anterior tibial	405	"
Posterior tibial	405	"
Brachial	115	"
Radial	59	"
Ulnar	59	"

There are two methods by which the torsion may be applied, as is illustrated by the accompanying cuts: 1, Limited torsion, and 2, free torsion. In the first method two pairs of forceps are required. The first pair grasps the vessel at its cut extremity and pulls it from the sheath. It is then seized by the second pair at a point from one-half an inch to an inch above the cut extremity of the artery, this second pair being held at right angles to the long axis of the vessel. The first pair is then given three or four sharp turns.

By the second method (free torsion) only one pair of forceps is required. It is the one recommended by Mr. Bryant as not being so likely to injure the external coat of the artery. And this is the method which was adopted in the cases which I have given. A good pair of forceps is required which will hold the end of the artery firmly, which has no lateral motion, and with serrations blunt enough to obviate any laceration or cutting of the parts seized by the blades. The vessel should then be drawn out as in the application of the ligature, and three or four sharp rotations of the forceps made. In large arteries, such as the femoral, the rotation should be repeated until the sense of resistance has ceased. The ends should not be twisted off. In small arteries the number of rotations is of no importance, and their ends may be twisted off or not, as may be preferred. In all of the cases mentioned in the above table, free torsion of the arteries and veins was the method resorted to, to control hemorrhage.

Fig. 1. Limited Torsion.

In addition to these cases, of which we have a record, torsion has been the method resorted to in all other surgical operations performed during this period, such as amputation of the female breast, the removal of tumors, the excision of joints, etc. It is within bounds to say that torsion has been resorted to at this Hospital in thousands of cases without any mishap. We have had no case of secondary hemorrhage which could fairly be attributed to the method of controlling the hemorrhage, not only at the Western Pennsylvania Hospital, but in all of the hospitals in Pittsburg and the surrounding towns. Torsion is the method most frequently resorted to for the arrest of hemorrhage. Our surgeons, as a rule, have more confidence in it than in the ligature.

Fig. 2. Free Torsion.

The following letter from Dr. J. J. Buchanan, the accomplished surgeon at Mercy Hospital, the second largest hospital in Pittsburg, bears out the truth of this statement:

August 30, 1893.

Dear Doctor Murdoch:—In reply to your query concerning my experience with torsion as a means of controlling hemorrhage, pemit me to say that I have used it constantly, though not exclusively, for twelve years for arteries of all sizes up to, and including the femoral, and have never known a hemorrhage to follow its employment. My colleague, Dr. R. W. Stewart, and myself, make frequent use of it in the surgical service of Mercy Hospital, both for arteries and the larger veins, and feel no anxiety concerning hemorrhage in our cases. Yours very truly,

J. J. Buchanan.

So, also, listen to what Dr. W. T. Huston of the Altoona General Hospital, says:

We find that torsion is just as safe as ligation, and gives nature a better chance for repair, for she has no foreign body to contend with as in ligation. At this Hospital I can safely say that there has not been one-half dozen ligatures in amputations during the last eighteen months, and we are having excellent results from the torsion of vessels. Dur-

ing the above-mentioned time there have been over fifty major amputations performed in which torsion was used for the control of hemorrhage. In all of these cases the patients never lost any blood from twisted arteries—not even from the femoral artery. We can, therefore, safely recommend torsion as an excellent means of controlling hemorrhage, and now we resort to torsion altogether, as it has given the most gratifying results in the control of hemorrhage.

Commendations like the above could be secured from every hospital in Western Pennsylvania.

The advantages of torsion as compared with ligation are:

1. The greater facility with which it can be applied.

I am fully aware that this proposition is disputed, but to those who are familiar with both methods there can be no doubt that torsion is the easier of the two. For the ligation of an artery an assistant is required to seize the vessel and draw it out while the ligature is applied. For torsion, the surgeon requires no assistant. The vessel must be seized by the forceps in either case. In torsion it only requires three or four turns of the forceps to complete the process, which can be accomplished in as many seconds. When a ligature is applied, let the operator be ever so skillful, the thread may break or slip off the vessel; but if neither of these accidents occur, the process can not be accomplished in anything like the same time.

2. Torsion is a safer method, being less liable to be followed by secondary hemorrhage.

This proposition has been absolutely proven by the experience in the use of torsion at Guy's Hospital, London, and I have now given additional proof by the experience given in this paper.

3. Healing is facilitated because the wound is free from any irritating or foreign body.

This proposition is so plain that it should not require an argument. It was true before the antiseptic treatment of wounds had come into such general use, but is doubly so now. The catgut ligature is, no doubt, a safer ligature than the silk, for it does not require an ulcerative process for its discharge, and when this ligature has been made thoroughly antiseptic it is, no doubt, the best. But a ligature rendered thoroughly antiseptic is not always at hand; and those surgeons who have had the most experience with the antiseptic treatment of wounds will, I think, be the first to admit that, in spite of their most careful attention, septic germs are often introduced into the wounds by means of the ligature. Even after every precaution in preparation and preservation, the handling of a ligature in its application is a frequent source of infection. But there are other objections to its use. The catgut ligature may dissolve before the artery has become closed by the natural hemostatic process, or it may unbind. Both of these accidents have been the frequent cause of secondary hemorrhage.

Being a frequent visitor at the principal metropolitan hospitals, both in our own country and in Europe, I am familiar with the practice of our most skillful surgeons. It is exceedingly annoying for me to witness a thread break or slip off an artery, which often happens in the effort to tie it, when I know that the vessel could be so easily twisted while it was in the grasp of the forceps. When I have asked many of our distinguished surgeons why they do not resort to the torsion, the reply is always the same: *we are afraid to trust it.*

This answer might have been given with equal force by Richard Wiseman in the seventeenth century, had he been asked why he did not resort to the ligature instead of the hot iron.

In a matter so important as the arrest of arterial hemorrhage, it is proper that surgeons should be conservative, but there is such a thing as pushing conservatism too far. In the torsion of arteries I claim we have an improvement upon ligation; its claims for recognition rest upon physiologic arguments which can not be shaken, and its reliability as a hemostatic has been proven by abundant experience.

CLINICAL NOTES.

A CASE OF GENERAL PERITONITIS CAUSED BY AN ENTEROLITH.

WITH A NECROPSY.

BY E. GRISWOLD, M.D.
SHARON, PA.

J. W., a strong, well built man weighing about one hundred and eighty pounds and 35 years old, had la grippe in the winter of 1891. He had been troubled for several years before with piles, but was seldom disabled entirely by them. By occupation he was a heater in a rolling mill. He never seemed to recover fully from the influenza; was troubled with frequent attacks of griping pains in the abdomen, and seldom had a good appetite. Later, these attacks sometimes became so severe, while at his work, that he was obliged to leave his furnace and lie down for a while. From this time onward he was obliged to employ a helper who could attend to his furnace during these attacks. Not long afterward he began to suffer severe griping and tenesmus at his stools. These distressing symptoms increased until they became so severe that he was afraid to be alone at stools, and was in the habit of having his wife or some one else with him. His stools were not abnormally frequent; nor did the pains connected with them seem to be modified by the condition of his piles. The pains centered, and radiated from, a point just below the umbilicus, and often affected the bladder. Notwithstanding the severity of his sufferings, at these times he would take a few minutes for reaction and rest, and then go to his work. He continued to do this until the conflagration which ended his life came.

On Monday morning, Aug. 6, 1893, about four o'clock, I saw him with his attending physician, Dr. J. H. Reed, and learned that he had been attacked with chills and violent abdominal pains about 7 A.M. on the day before. Dr. Reed did not see him until 3 P.M., when he found his suffering was intense, the pain centering largely near and below the umbilicus, followed toward the next morning, at the time of my visit, with pains down the right spermatic cord and retraction of the testicle, suggesting the possible presence of renal calculi. The temperature was 102 degrees; pulse 120; anorexia and nausea. The bowels had been loose the day before the attack. A careful examination led to the conclusion that there was general peritonitis. There was tumescence, tympanites, tenderness and partial rigidity of the abdominal muscles, with dorsal decubitus. The history of the case did not point to appendicitis, typhlitis or cecitis. Treatment, alterative doses of calomel, with

opium *pro re nata* and external applications of heat. The next day the pain, fever and nausea were slightly diminished, but the pulse was more frequent and weaker. There was progressive failure of the vital forces which, with a diminution of pain and increased frequency and weakness of the pulse, continued until death, which took place on Thursday at 2 P.M., a little more than four days from the attack. The bowels were slightly moved by enemata on the third day.

Necropsy.—An incision extending from the xiphoid cartilage to the symphysis pubis, revealed peritonitis involving all in sight. The vessels of the omentum were ingested so as to produce deep discoloration, and the entire visible peritoneum was involved. There were but trifling adhesions of the intestinal coils or of the omental folds, and this organ covered the intestines in its normal way. There was a small quantity of pus in the dorsal grooves each side of the spine, behind the intestines and mesentery. Upon searching for the caput coli and appendix it was found that there was no evidence of further inflammation about the cecum or any part of the colon or mesocolon than at other parts. There was simply peritonitis; no adhesions, no effusions, no infiltrations, no abscess. On raising the ileum from its dependent position, the cecal end of the appendix was brought into view. It was of normal size and less discolored than the surrounding peritoneum. It was attached to the anterior inner aspect of the caput coli and took a direction toward the median line of the body, with a slight upward trend. Following it with the fingers, it was soon seen to show signs of inflammation and to be attached to the ileum, which was here much thickened and discolored. On loosening it from its attachment to the ileum, its end was found to be bulbous in shape and of the size of a black walnut. This bulbous end was also adherent to the abdominal wall, just above the promontory of the sacrum. Having loosened it from its attachment, it was found to have been lying on the ureter of that side, and that the portion of the peritoneum covering the psoas magnus, and neighboring areas, was ulcerated and bathed in pus. The appendix was cut off close to the cecum and preserved. While examining the ulcerated area of the peritoneum and handling the coils of the ileum, a calculus was found. Its size was a little less than that of a filbert, its shape spheroidal, its surface irregular but without facets, and of a fawn color; the color much resembling that of biliary calculi. It was undoubtedly an enterolith. Searching for its place of escape from the intestinal canal, the bulbous end of the appendix was found to have a hole in it of sufficient size for its escape, and a cavity large enough to hold it. As the cecal end of the appendix was not enlarged, and there being no evidence of recent irritation or inflammation in that part of it, the conclusion seemed to be irresistible that the calculus was an old resident in the distal end, and that the inflammatory process and enlargement of the part containing the calculus had been the cause of the paroxysmal abdominal pains, and of the tenesmus and nauseating symptoms experienced at stool for some time before rupture and the onset of general peritonitis.

The literature of appendicitis, its concomitants and sequelæ, has been so copious of late that nothing less than an anomalous case would seem to invite a report. But the frequency of cases of peritonitis and appendicitis in my practice of late, has led me to think that the light should be turned on whenever practicable. On making the diagnosis in this case, recovery was thought possible, though not probable. There was no satisfactory evidence that the case was caused by appendicitis, the malposition and adhesion of the appendix being of impossible determination. A celiotomy not later than the first day might have saved the patient if the calculus had been found and removed, but the finding and removal would have been more a matter of accident than of operative skill. The only symptoms of calculus, as already stated, pointed to the kidney. I regard this case as anomalous in the following particulars:

1. The presence of a calculus in the distal end of the appendix, adhesions to the ileum and ureter with a nearly normal condition of the cecal end.

2. The symptoms of renal calculus were caused, no doubt, by the adhesion of the sacculated or bulbous end of the appendix to the peritoneum over the track of the ureter, as well as the inflamed and ulcerated condition of that membrane.

AN IDIOSYNCRASY.

BY JAMES HARVEY RAYMOND, M.D.
CHICAGO.

"A peculiarity of constitution in which one person is affected by an agent, which in numerous others would produce no effect."

It is not an uncommon occurrence in the practice of a physician to meet with a case wherein the judicious administration of a known harmless drug has produced alarming symptoms, and occasionally a case is seen in which unusual and unexpected effects are produced by different foods or even odors. This condition is known as "idiosyncrasy," and it is, at present, beyond the power of the physician to point out definitely a pathologic condition that may be considered a true etiologic factor. The best hypothesis yet offered is, that it is an exalted *reflex act*. I was told by Professor Walter S. Haines, of a clergyman in an eastern city, who, being the unhappy possessor of this peculiarity, was forced to request friends with whom he would dine, to allow no raw apples to be put upon the table else he succumb to the ill effect of their odor, which effect was a most distressing illness. Professor Haines also mentioned this peculiarity in a near friend who was the victim of the odor of the tuberose.

However numerous this class of cases may be, I am sure they are not met with every day, and it is for this reason that I am pleased to bring before the notice of the younger members of the profession a few interesting facts concerning the effects observed in a case following the administration of 5 grains of Dover's powder, the formula of which is:

℞ Ipecac gr. ss.
Pulv. opii gr. ss.
Sacch. lac. gr. 4.

Considering the physiologic action of the above we find the opium contains about twenty alkaloids, the most common of which are, morphin, codein, narceina, papaverina, narcotina, meconin, apomorphia, thebain and cryptopia.

The action of the crude drug and its various preparations is: Analgesic hypnotic, diaphoretic, antispasmodic and narcotic. The alkaloids, with the exception of the last two named, thebain and cryp-

topia, are said to be anti-spasmodic and hypnotic, morphin being the most powerful in its effects. Thebain and cryptopia are spasmodic in their action, and in doses larger than gr. 1ss. may cause convulsions. One grain of opium is said to contain from 1-1500 to 1-100 grains of thebain and 1-3000 grains of cryptopia. Making due allowance for the anti-spasmodic effects of all the other alkaloids of the drug and other constituents, together with the minute quantity of those alkaloidal substances capable of producing spasms, it is unexpected and, I might say, phenomenal to witness a violent convulsion the outcome of a dose so small in quantity as 5 grains of Dover's powder, which would contain from 1-3000 to 1-200 grains of thebain.

I was called to attend a patient suffering with an acute bronchitis, age, 29 years, married and mother of two children, no organic disease of heart or other organs, family history good, past history good, general health good, not pregnant, pulse slightly accelerated, full and regular, temperature 100. I prescribed a saline cathartic and a simple expectorant mixture containing:

Ammoniæ carb.
Tinct. belladonnæ.
Syr. pruni virginianæ.
Syr. glycyrrhizæ.

I called the next morning and found the patient doing nicely, pulse and temperature normal. I ordered a foot bath, and 5 grains of Dover's powder, which was sent for and taken in my presence. In less than thirty minutes the patient was taken with a severe pain in the back, the most agonizing gastric pain and coldness of the extremities. Tonic contractions of the muscles and total loss of consciousness followed, lasting about ten minutes. The convulsions were epileptiform in character with no frothing at the mouth or biting of the tongue. Diligent inquiry revealed no history of epilepsy either in herself or family. The patient had taken at no time during the day anything of the nature of an irritant, nor could any drug or food be found in the house which afforded suspicion. I was greatly relieved when she regained consciousness and asked me if opium had been given her, stating she was always affected in this manner by opiates. She informed me that morphin caused most distressing cerebral symptoms, in fact "true delirium tremens," but no bodily pain or convulsions.

The practical deduction is, the advantage of taking a most thorough history of each case, and thus avoid the unnecessary and appalling experience that we are apt to meet at any time, if we neglect to inquire as to "idiosyncrasy."

NECROLOGY.

Dr. Paul of Havana, Ill., December 2.

Dr. W. J. Kelsey, of Cassopolis, Mich.

Dr. W. R. Berry of Gallatin, Mo., November 29.

Dr. Paul Hoffman of New York, December 2.

Dr. Alexander Guy of Oxford, Ohio, November 30, aged 93 years.

Dr. John E. Hing of Alma, Wis., aged 86, died November 20. He was the first physician in the County of Buffalo.

Dr. Francis Hagaman of Montgomery County, N. Y., died December 7 at Amsterdam, aged 74 years. He is survived by two daughters.

Dr. W. J. B. Baird of Seattle, Washington, died November 30, after a short attack of rheumatic fever, complicated by chronic valvular disease of the heart.

Dr. Samuel Moore Logan, formerly of East Boston, died recently in Riverside, Cal., at the age of 65. Dr. Logan was graduated from Harvard Medical School in 1861.

Dr. William Caswell, a Brooklyn physician, was found dead in his bed December 8, at his home, 986 Hancock Street, in that city. Heart disease is believed to have been the cause. He was 62 years old.

Dr. George B. Boyd, one of the oldest physicians in Scranton, Pa., was found dead in his bed at his residence. He was 65 years of age, and had practiced medicine in Scranton for nearly thirty years.

Dr. D. S. Sampsel, Sr., died December 10, at Ashland, Ohio, aged 71 years. He had served two terms as Mayor of Ashland and was mentioned for that office next spring. He was a leading candidate for Congress in the convention which nominated M. D. Harter three years ago.

Dr. N. L. Luck of Penn Yan, N. Y. He was one of the prominent physicians of that village and an officer of the Yates County Medical Society. The deceased was about 50 years of age, and had resided in Penn Yan over fifteen years. He leaves a wife and one son, Loren, who has always lived in Penn Yan.

Dr. E. H. Bowman, at his home in Andalusia, Ill., November 30, of pneumonia, after an illness of only a few days. He was 77 years old. Mr. Bowman was the oldest physician in this county, also the oldest member of the Illinois and Iowa Medical Society. During the war he was Surgeon of the 27th Illinois Infantry, General W. A. Schmidt's regiment.

Dr. James M. Bowling died November 30 at his residence in Nashville, Tenn. Dr. Bowling had long been a conspicuous figure in Nashville and was noted for his wealth and keen business sagacity. He was born in Adairville, Ky., seventy-seven years ago, where he married Miss Lucy E. Snadon, a lady of wealth and culture. Dr. Bowling was a practicing physician for many years, but retired some years since. He leaves a wife, but no children.

Dr. Roswell G. Bogue died in Chicago, December 8, at his home, No. 5 Washington Place. Dr. Bogue was born May 3, 1832, in Louisville, St. Lawrence County, New York, the son of Warren S and Sallie Underwood Bogue. His education was obtained in the district schools and at Castleton Academy, Castleton, Vt. His early years outside of school were spent on the farm and in school teaching up to the time when he determined to follow the profession of medicine. Dr. Bogue studied medicine with Dr. Harmon Gay at Columbus, Ohio, and graduated from the College of Physicians and Surgeons in New York City in the winter of 1856-57. He came to Chicago in the early spring of 1857 and practiced medicine continually until he was disabled by total blindness in 1888. Dr. Bogue was appointed Surgeon of the 19th Regiment, Illinois Volunteers, in August, 1861, and continued in the service in the Army of the Cumberland until the regiment was mustered out near the close of the war. He participated in the battles of Stone River and Chickamauga and the Atlanta campaign. Dr. Bogue helped to organize the Cook County Hospital, and for thirteen years was one of the attending surgeons. He was the first Professor of Surgery in the Woman's College. He was also the attending surgeon in the Hospital for Women and Children during the years following its organization, and was Consulting Surgeon at the time of his death. He was also Consulting Surgeon of the Presbyterian Hospital and St. Joseph's Hospital. Dr. Bogue leaves a widow and two daughters, Mrs. Dr. Hough and Miss Lucy Bogue.

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MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues and subscription for THE JOURNAL. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

All members of the Association should send their Annual Dues to the Treasurer, RICHARD J. DUNGLISON, M.D., Lock Box 1274, Philadelphia, Pa.

SATURDAY, DECEMBER 16, 1893.

GRATUITOUS VACCINATIONS BY BOARDS OF HEALTH.

The newly elected President of the New York County Medical Society, DR. SENECA D. POWELL, in his inaugural address takes occasion to find fault with the city sanitary authorities for the too liberal and indiscriminate proffers of vaccination made to people who are abundantly able to employ practitioners—their own family doctor for example—to do the vaccination. He does not censure the special corps of vaccinators so much as the Board that employs them. The subordinate officers simply obey orders and use the various aggregations of unprotected persons whom they have found in large dry-goods stores, and the like, to swell their reports of a large number of proffers of vaccination, and a large number of operations performed. The vaccinating staff can not with justice be charged with any other fault than that of over-zeal, but the effect upon the opportunities of the family physician are curtailed in consequence of this zeal of duty. This of necessity gives ground for complaint. DR. POWELL does not complain of the zealous work that may be done in the crowded tenement houses, lodging houses, and in the poorer localities, but when free vaccination is furnished in the offices of rich corporations and in the commercial exchanges, DR. POWELL asserts that there has been unjust interference with the province of the profession. It is tantamount to an abuse of office power and opportunity, and right-minded medical men, if in official control of the Board of Health, should see to it that the subordinates should not do too much free work. Few reputable physicians consent to do work for rich corporations without an adequate recompense, and there is no good reason why the employes of our Boards of Health should be put in a position where they may feel compelled to render unpaid services. DR. POWELL held up as a bright and shining example, the corporation lawyers of rich companies, who he says, "never belittle their professional standing by charging any other than the largest regular fee." We are not sure that DR. POWELL is correct in his premise, unless he hedges himself behind a very strong definition of the words, "reputable lawyers." It may be that he is arguing in a circle—the *ignoratio elenchi*. We have met with lawyers that departed somewhat from the full fee bill rather than lose a rich corporation. However that may be, we believe that the notice taken of this subject in a bold way, will effect a change for the better in some official quarters.

If there is danger that the vaccination will be done inefficiently, or not at all, let the Boards continue to vaccinate rich and poor alike, but let them charge those able to pay, and let the sum thus created be deposited in the public treasury to the credit of the Board.

AUTHORITY WHICH CAN NOT BE CONFERRED UPON BOARDS OF HEALTH.

No law or ordinance can be valid which by its terms authorizes a board of health to grant one person a license, and refuse another, under the same circumstances. For example: an ordinance is void which is intended to confer upon a board of health, or upon the board of health and common council of a city, the undefined power of determining by whom, in what location, and as to the character of the building in which the business of tallow chandleries, soap factories, glue factories, slaughter houses, magazines, tanneries, or other hazardous trades or business may be conducted. If it be conceded that power exists to declare a tannery, or any other business, a nuisance, and to provide for its summary abatement, or if it be conceded that such business is a nuisance *per se*, the power to permit such business by express license ought not to and can not exist. But if such business, by reason of its location, the character of the building in which it is conducted, or the manner in which it is conducted may become a nuisance, the most that can be claimed by a city is the power to regulate or to abate such business.

The Supreme Court of Indiana so deciding, Nov. 2, 1893, in the case of the City of Plymouth v. Schultheis, finds a precedent in a former case in which it decided against the validity of an ordinance requiring that hospitals should be conducted only upon permit, to be secured upon notice and application to the common council and board of aldermen. It was apparent, it said, in that case, that under the ordinance, if valid, the common council and board of aldermen had the power to grant or refuse the license in any given case at their mere pleasure, and that no one could conduct or maintain a hospital within the city, however harmless or beneficial it

might be, except by their consent. No law could be valid which by its terms would authorize the passage of such an ordinance. What the Legislature can not do directly in this respect, it can not authorize a municipal corporation to do.

THE DAVID LIVINGSTONE MEDICAL COLLEGE IN LONDON.

DR. HARFORD BATTERSBY, formerly a medical missionary in the British dependencies along the River Niger, has become the principal of a new medical school in London. The object of this school is to furnish at the lowest possible cost, the training that will be most useful to intending missionaries, very few of whom are able to spare the years of study and waiting that are essential to the regular English school and qualifications. As a large number of the missionaries sent out from British countries are destined to some tropical station, it is a matter of the first importance that those persons should be instructed as to the hygiene and principal maladies of hot climates. A little knowledge of surgery is also considered important, not only as regards the welfare of the missionary who may perchance be located hundreds of miles distant from any surgeon, but also as to the poor heathen. On this latter point, it may be said that, taking parts of Central Africa for example, wars, witchcraft and slavery, famine and a long list of violent causes spare neither the cradle nor the grave; it has been stated that it is the exception, rather than the rule, for the natives of that part of the world to die a natural death. Scars, maimed limbs and the loss of vision are seen everywhere. Under circumstances such as these, a little knowledge of surgery—being better than no knowledge at all—is not a dangerous thing, as the adage has it. The college has the free services of a corps of able teachers, and the missionaries will get their clinical experiences by spending a part of their time in the God-forsaken slums of East London.

THE ASSOCIATION.

Let every medical man whose eye may glance at this column, ask himself whether or not he would like to see the ASSOCIATION so strong in numbers that its voice would be authoritative.

Let him reflect that with a great membership, would come the financial ability to purchase articles; to increase the number of pages; to illustrate articles better; to have better typographical work; to have more machinery; in a few words, to have a journal of the highest class, without increasing the cost to individual members.

Let him consider that a large membership will give means of encouragement, by prizes or otherwise, to original investigators. That it can influence meritorious legislation, and retard or stop the passage of bad measures. Having thus reasoned, let him ask how he can personally lend his aid toward the accomplishment of these ends.

Let him sink personal feeling or disappointment; his own friends may be in command next year, if they are out now. Let him use his personal influence to induce every worthy physician of his acquaintance to become a member of the ASSOCIATION, or a subscriber to the JOURNAL. His duty to the ASSOCIATION will then have been accomplished. Let us have no stopping place until our membership surpasses any other.

Are there wrongs in the ASSOCIATION? Correct them by appearing in your place when the ASSOCIATION meets, or write your views to your JOURNAL for publication. In our ASSOCIATION the majority govern; if your views are correct, you can always have an intelligent support in the ASSOCIATION.

Help your JOURNAL property, of which you are part owner, by giving it all the influence you can wield in its favor. To ask a man to help build up his own property is surely not asking him too much.

Let us start the new year with a great rush; every new subscriber to your JOURNAL makes it easier to obtain paying advertisements, and these in turn add to the value of your property.

Write for your JOURNAL; for two years try to increase the membership by individual effort, each within his own circle, and the great work of organization will be over.

THE RICHARDSON MEMORIAL ADDITION TO TULANE UNIVERSITY.

The dedication of the new Medical College building of the Tulane University took place November 4.

After a prayer by Archbishop Janssens, Judge Chas. E. Fenner, President of the Board of Administrators of the Tulane Educational Fund, then formally presented the building to Col. William Preston Johnston, President of Tulane University.

His address was as follows:

The brief and modest inscription which attracts the attention of all who enter this structure informs them in simple words that "This building, dedicated to medical science under the auspices of the Medical Department of Tulane University of Louisiana, is erected by Ida A. Slocomb in memory of her husband, Dr. Tobias Gibson Richardson, Professor of Anatomy 1858-1872, Professor of Surgery 1872-1889, Dean of the Medical Faculty of 1865-1885." It is thus recorded that Dr. Richardson devoted thirty-one years of his life to active service as a Professor in the Medical Faculty, during twenty of which he served in the responsible office of Dean, the Executive and President of the Faculty.

It may be added that when Paul Tulane consummated his noble design for the creation of the great University in this city which now bears his name, he selected Dr. Richardson as one of the original administrators of his noble trust. His services to the cause of medical education which had consumed the best years of his life, while losing none of their devotion to that cause, thus formed a broader field in the task of organizing a University embracing, not only medicine, but the whole range of the liberal arts and sciences. Into this task he threw the whole enthusiasm of his nature. His wise counsels, educational experience and persistent energy were given without stint to the organization and development of the University in all its branches, and whether you stand in these halls specially devoted to medi-

cal science or in those devoted to any other department of the University, you may still justly say of him, "Si monumentum quæris, circumspice!"

I am not expected on this occasion to deliver a formal eulogy on Dr. Richardson. That grateful duty has been already performed by abler hands than mine. The administrators of Tulane education fund, the Faculty of the University, the Faculty of the Medical Department, the session of the church of which he was an elder, the various medical and educational societies of this State and other learned bodies, have signified their appreciation of his life and character in feeling and eloquent resolutions, which voice sentiments common to the whole people among whom his noble and beneficent life was passed. The last public commencement of the Medical Department was appropriately dedicated to the commemoration of the life and services of this great and good man, and all remember the eloquent and touching tributes which were paid on that occasion by the distinguished Dean of the Medical Faculty, who had been his colleague for so many years and his intimate friend, and by our eminent fellow-administrator, Dr. Palmer, whose matchless oratory derives added force from the deep affection and veneration with which he is regarded by all classes of his fellow-citizens.

On the 9th day of May, 1891, a letter was received from Mrs. Ida A. Richardson, addressed to "Hon. R. L. Gibson, President of the Administrators of the Tulane Education Fund," and saying in brief terms, "If the administrators will furnish a suitable site for a medical college I will contribute $100,000 toward the erection of the building, to be paid from time to time as the work progresses." This letter was the consummation of a purpose which had for a considerable time been germinating in the mind of Mrs. Richardson with the full knowledge and sanction of her husband. It was designed by her as a monument and memorial of him, and was approved by him as the form in which her wifely devotion might best honor him. Although he did not live to witness the consummation of the work which we this day celebrate, he lived long enough to see it fairly begun and to experience the consolation afforded by the certainty of its completion.

The special committee appointed by the Board of Administrators selected as special agent one of its members, Dr. Edmond Souchon, who, with the approval of the Tulane committee and of Mrs. Richardson, was intrusted with the responsible duty of designing the floor plans and the interior arrangements of the proposed building. Dr. Souchon possessed rare qualifications for this duty, and while he acknowledges the invaluable advice and assistance which he received in every stage of the work from the able and distinguished Dean of the Medical Faculty, all agree that to him more than to any other is due the credit for the admirable floor plans and commodious interior arrangements which distinguish this structure, and that debt to Dr. Souchon has been acknowledged by the special inscription in his honor placed in the vestibule. These plans having been approved by the Medical Faculty and the Tulane committee, Messrs. Sully and Toledano, the eminent architects, were employed to embody them in architectural form and to prepare specifications, invite contracts and superintend the construction of the building. The work was prosecuted with all possible energy under the energetic supervision of our building committee, with the avowed purpose of having the building completed in readiness to be occupied by the Medical Department for the session of 1893-94. That purpose has been successfully accomplished.

The death of Dr. Richardson enlarged the scope of the original bounty of Mrs. Richardson, who then regarding it as strictly a monument to her husband, seems to have determined that not only the cost of the building, but the whole cost of completing the removal, furnishing and equipment should be at her sole expense. With this view she has given the administrators the considerable additional sums which have been necessary to accomplish these important purposes. And to-day this completed building, with all its new furniture and equipments, may be said to have been paid for by her, and to stand, free from all debt, as a monument to Dr. Richardson, erected wholly by his wife.

What a monument it is! How the costly sarcophagi, the lofty columns, the proud cenotaphs that adorn our cemeteries sink into insignificance beside it! These link the name of those whom they are designed to honor only with the past. This entwines it with the living future, associates it with active, persistent forces that continue to operate with expanding energy through succeeding generations, and thus, by ever renewing benefactions, vitalize and give a common immortality to the name of him whose noble life inspired the purpose, and of her whose generous love executed it.

In behalf of the administrators of the Tulane education fund, I desire to express their profound appreciation of the wisdom, energy and economy with which this important work has been performed. The opinions of those most competent to judge, concur that this building, with its equipments and appliances, in commodiousness and in complete adaptation to the complex requirements and needs of the most advanced medical and pharmaceutical instruction, compares favorably with those of any medical college in America, and that the result has been achieved at a cost far less than has been expended by other institutions in establishing accommodations by no means superior. With these extraordinary advantages, with the incomparable clinical opportunities afforded by the great Charity Hospital, with an advanced and advancing standard of proficiency, and with a faculty of distinction, experience and approved ability, it is not difficult to foretell a brilliant future for this medical department which will reflect honor upon the University, of which it is a branch, and will vindicate the wisdom of the generous donor, and will hand down the memory of Dr. Richardson and his devoted wife to the blessings of untold generations.

And now, President Johnson, to you as President of the Tulane University of Louisiana, I am instructed by the administrators of the Tulane education fund to consign the care and custody of this building and its contents, to be devoted to the purposes for which it is designed, confident that under your wise supervision, with the coöperation of the Dean and Faculty of the Medical Department it will be so administered as to satisfy the wishes of the donor, to honor the memory of Dr. Richardson, to be a glory to the University, and to extend to this and coming generations the advantages of the best and highest medical education.

In accepting the property on behalf of the University, the President said:

Mr. President:—In your official capacity as President of the administrators of the Tulane educational fund, and on their behalf, you have delivered to me, as President of Tulane University, these buildings and grounds. This is in pursuance of your agreement with the State to build up a great University in the city of New Orleans. The Medical Department for whose use this splendid structure is designed, is by many decades the oldest branch of the University, and as its usefulness has extended to every section of the South, so has its fame spread as the years went by.

At a providential moment, when its requirements pressed heavily on its resources and expansion seemed a necessity of self-preservation, a beneficent hand was stretched forth to its aid, and in a brief space of time more than we dreamed of has been accomplished.

The gracious benefactress, your distinguished Board, and a friendly public to whom its worth is well known, all feel that in the hands of our Medical Faculty everything will be done for medical science and education that their resources will permit. The character of that Faculty as men, even more than their distinction as scientists, is a guarantee that this sacred trust will be employed.

It is therefore with pleasure and with a sense of profound gratitude to her from whom this gift came, and to the Spirit of Good who inspired it, that I commit this building and equipment to the custody of the Dean and Faculty of the Medical Department of Tulane University, for the uses for which it was designed.

In accepting the custody of the new college, as Dean of the Medical Faculty, Prof. S. E. Chaillé, M.D. said:

Mr. President:—This great building and its spacious grounds and their valuable contents, the whole exceptionally well adapted to the needs of medical education, have been transferred through you from the University to the Medical Department, in order that its Faculty may occupy and utilize them. The Medical Faculty gratefully accepts this transfer, with full realization that the greater the gift the greater the obligation, and with firm determination that the responsibility, however great, shall be amply discharged; so discharged that the Medical Department of the Tulane University of Louisiana shall continue to be even more conspicuously than in the past the most famous and the most popular, as it is also the oldest medical college in the great Southwest.

The very warmest thanks are due to our colleague, Prof. Edmund Souchon, the agent unanimously chosen by the

Faculty to supervise not only the construction of the building, but also the supplying it with its contents; in fine, the agent to do the many and important things requisite best to adapt our building to the purposes of medical education. He has discharged his very onerous duties, burdened with endless and harassing details, with marked ability and conspicuous fidelity, and these virtues have yielded the very best results, because invigorated with the ceaseless and the enthusiastic zeal which springs only from labors of love. The Dean of the Medical Faculty gladly avails himself of this public opportunity to proclaim that the burden taken from his shoulders by his colleague was heavier than the Dean felt himself able to bear, and that his good friend, Prof. Souchon, discharged all the duties imposed on him better than the Dean himself could have done.

But of the memories of the living which most endear this structure to the Medical Faculty, none are as grateful, none are as loving as those due to the fact that our building came from the generous heart of a loving wife, from the gracious hand of a gentle woman of New Orleans, than whom there is not one better deserves to be and is more honored and more beloved.

Having briefly alluded to some of the grateful and loving memories already attached to our new building, still briefer allusion will be made to some of the hopes entertained by the Medical Faculty. But before giving expression to these I can not resist the temptation to state that the Faculty does not indulge any hope that our college, though its comparative superiorities are very great, is destined soon to become the ideal medical college which many dreamers idly anticipate and which is to have every possible need amply supplied and every professor endowed with the wisdom of Solomon and the perfection of saints. Were there no other obstacles to the realization of this vain hope, the very highest authority on the subject estimates that the ideal medical college would require not less than $3,000,000 instead of one-fifteenth part of that amount invested in our college. As well as, and probably better than others, the members of the Medical Faculty realize the lack in this, as in every college, whether medical or not, of much that is desirable, and are in no need of criticisms, though these are often proffered gratuitously—if these criticisms be not destitute of practical suggestion which the Faculty will always highly prize as the ways and means by which whatever that is lacking can be supplied.

None the less, the greater resources now placed in the hands of the Medical Faculty, the past history of this Faculty and the recent prosperity of our college all unite to justify our very sanguine hopes. The hope that this college will become illustrious for the ability, fidelity, learning and eloquence of its Faculty, the hope that its students will be noted for exemplary conduct; noted for their zeal in utilizing the exceptional advantages here given them; noted for their devotion to this college, "the dear mother" destined to give them professional truth, and noted for the renown to be bestowed upon their college by their own honorable and prosperous careers.

The hope is also devoutly cherished that benefits so great will be bestowed on medical education, involving vitally as it does the highest welfare of the people, that our college will become an object of pride and affection, not only to the medical profession, but also to the people and not only to the people of New Orleans, but also to the people of every State of our dearest South and of all the States of our beloved country.

Prof. Edmund Souchon was then introduced by Dr. Chaillé. He gave a full and accurate description of the building and its contents. Dr. Souchon was warmly applauded as he closed his address.

The ceremonies were then brought to a close by Rev. Dr. B. M. Palmer pronouncing the benediction.

The building is composed of three connected buildings. The center one contains principally the lecture room, having over it the amphitheater and two wings which contain the laboratories, dissecting rooms and museum.

The basement is well lighted, and contains a study room for students, a recitation room, and an embalming room.

The microscopical, chemical, pathological, bacteriological and pharmaceutical laboratories are supplied with the latest improvements, and form one of the most complete medical institutions in this country.

SOCIETY NEWS.

Medical and Chirurgical State Faculty of Maryland.

Semi-Annual Meeting held at Annapolis, Md., Nov. 22-23, 1893.

DR. GEORGE H. ROHÉ, President, in the chair; DR. WILLIAM B. CANFIELD, Secretary pro tem.

FIRST DAY—TUESDAY, NOVEMBER 22.

DR. ABRAM CLAUDE of Annapolis, delivered the

ADDRESS OF WELCOME,

In which he heartily greeted the Society and bade them welcome in the name of the Anne Arundel County Medical Society.

DR. GEORGE H. ROHE then delivered the

PRESIDENT'S ADDRESS,

In which he thanked Dr. Claude and the medical profession of Anne Arundel County, and referred to the growth of the Society. He suggested some very important and practical changes which were acted on in the business meeting of the Society.

DR. WALTER B. PLATT then read a paper entitled

A CASE OF LAMINECTOMY; OPERATION ELEVEN MONTHS AFTER INJURY TO THE SPINE.

Hippocrates, who was such a voluminous writer, does not mention this operation. Paul of Ægina, was the first writer, nearly twelve hundred years ago, to notice this operation. It was generally fatal in its early days because it was not done with antiseptic precautions. Henry Klein, in 1814, was probably the first surgeon to do the operation. This patient died and the surgeon was censured. Many others after him reported fatal cases. It makes a difference whether the operation is done at once, immediately after the injury has been received, or some time after the injury. Fractured laminæ are generally present with the fractured spine. The laminæ become displaced and press on the cord. The operation should never be done to relieve the paralysis of Pott's disease until all other means have been tried and the patient is growing worse. Statistics show that over 80 per cent. of such cases recover without operation. In perfectly hopeless cases the operation is advised. His patient had first slipped on the stairs, and two weeks later he fell from a car, and one week after that he suddenly complained of extreme pain in the back and went to bed. There was found a curvature of the spine at the point of pain, and below this there was complete paraplegia with loss of sensation. Bed sores appeared, but there was no discharge of pus from any place except from the bed sores. The operation had been done about two weeks ago, and two parallel incisions were made to the inner side of the transverse processes and were joined by a transverse incision, making an H-shaped appearance. The hemorrhage was checked by pressure and the laminæ of the fifth, sixth and seventh vertebræ were cut off. The flap was turned down for four inches and the dura was exposed; it looked healthy. The flap was replaced and no arteries were tied and the operation lasted one hour and twenty minutes. There was copious venous hemorrhage. He is at present writing, better, but still has skin anesthesia; there is no improvement in motion. In such operations the improvement in sensation comes first. The patient can lie on either side without fatigue, and no longer has night sweats as he had at first, although the most careful examination failed to show at any time any signs of tuberculosis of the lungs. Dr. Platt also showed a specimen from a cadaver to illustrate his paper.

In the discussion which followed, DR. RANDOLPH WINSLOW said he had been considering the propriety of doing this operation, and he related several appropriate cases from his own practice, cases which from falls and other accidents had fractured some part of the spinal column, and in whom an operation had not been successful. In one case there was complete paralysis below the eighth nerve, and in another case there was paralysis from the clavicles down, and in neither case did an operation do any good, and he did not put much belief in laminectomy.

DR. GEORGE J. PRESTON said that in the last few years he had seen several such cases, and in some he had recom-

mended an operation with bad results. He does not know which cases should be operated on. If the cord is cut entirely across, an operation will do no good. The spinal cord in human beings will not unite to any extent, as it does in dogs after section, and as the nerves do. If an operation is to be done it should be done at once, for if we wait until secondary degeneration has set in it will do little good. The operation should be done a few days after shock, hemorrhage and effusion have passed away; then operate as we do in other cases. There is not so much injury done by the pieces of bone as by effusion and tissue formation around the cord.

Dr. Platt, in closing, said that the prognosis of this injury and of the operation depended on what part of the spinal column was injured. In general, the nearer the head the less chance there was of success. We should always consider laminectomy as we do trephining of the skull; in fact, laminectomy is nothing more than trephining and the mere operation is not of itself dangerous; it is only the injury that is to be feared. If the body of the vertebra is fractured we can expect little. Hippocrates gives good advice on this point.

Dr. J. H. Branham then read a paper entitled

TUMORS OF THE SUPERIOR MAXILLA,

In which he gave an extended account of his method of operating in such cases, and exhibited specimens illustrating the subject.

Dr. Randolph Winslow read a paper on

AMPUTATIONS,

In which he said that since the introduction of rapid transit in our large cities, surgery of all kinds had increased, and particularly was there greater necessity for amputations than before. He considered the condition of the blood supply to the injured parts the most important condition for a successful result in such operations. He then related several cases and mentioned complications as tetanus.

Dr. J. M. T. Finney said he would like to emphasize a remark of his late instructor, Dr. John Homans of Harvard, who was Professor of Surgery there. He said that any fool could amputate a leg, but that it took a surgeon to save it. Dr. Finney thinks there are other methods than amputation and Thiersch's skin grafting is one. There seems to be a tendency to save limbs entirely useless for a future amputation. This may be a good thing, because a stump made from a later amputation in which the parts are in good condition is a much better stump than the one made at the time of the injury. All these things must be taken into consideration. There is no question so important as whether we should amputate the limb or not. Another point Dr. Winslow had made was the time of the operation. He had recommended waiting until reaction from shock had set in. The majority of cases are much better operated on at once unless the shock is very severe. Dr. Winslow referred also to the question of tetanus; it does occur in a certain number of cases, but the bacillus tetani is anerobic and grows best where the air does not have access to it. In a bullet wound, or punctured wound from a toy pistol or rusty nail, there is danger of tetanus, and as most earth so often contains this bacillus, it is carried in with the object wounding and stays in the wound. This can be guarded against by laying such a wound open freely, the more freely the better.

Dr. Winslow, having been called from the hall, was able to make no reply to these remarks.

Dr. William T. Cathell then read a paper called

A STUDY OF THE EFFECTS OF TOBACCO ON THE THROAT AND NOSE.

He divided those who used tobacco into three classes; those that tobacco did not injure at all, those that it injured to a slight degree and those to whom it was a poison. The oil and nicotine are the poisonous ingredients. He condemned especially the short pipe and the stump. He thought that the pipe might be the exciting cause of cancer of the tongue and lips, and tobacco might cause polypi. He painted a very sad and painful picture of the evil results of using this baneful weed, and especially considered it injurious to the young and growing.

Dr. C. Birnie, Taneytown, Md., did not think that physicians could dwell too much or too strongly on the harm which tobacco does to growing boys, but he thought that the rest of Dr. Cathell's indictment was altogether too severe and not supported by facts and sufficient proof of his statements. For his part he did not believe that tobacco had ever caused cancer or polypi. The very common remedy among people in the country is tobacco. The wet tobacco leaves or a wet quid from a friendly mouth is put on a fresh wound and never removed until it heals and recovery is perfect. He has seen this often, and while he does not advocate it, he knows that the wound gets well; whether the tobacco does it or not it is not easy to say, but the wound certainly never gets worse from it. It may possibly be a case of post hoc. Chronic conditions of the nose and throat are as common in the country among women as among men, and women do not use tobacco as men do.

Dr. Wm. H. Welch agreed heartily with what Dr. Birnie said, and was glad to hear his remarks after the gloomy picture presented by Dr. Cathell. There is very little evidence to show that tobacco produces organic or malignant disease. The mechanical action of the pipe may cause an epitheliomatus papilloma of the lip but not a cancer. He was much interested in Dr. Birnie's remarks on the way the people treated wounds in the country by tobacco. It had been shown in his laboratory at the Hopkins Hospital that the action of tobacco smoke on bacteria, as the smoke was drawn through the culture tube, was inhibitory. There had also been a physician in his laboratory who had always the diplococcus pneumoniæ in his mouth, and from whom other workers used to get it for cultures. This physician began to chew tobacco and no more cultures could be made from his mouth secretions, as the tobacco had killed the organism.

Dr. Abram Claude of Annapolis, said he had been practicing for fifty-five years, and was now 74 years old, and he had chewed tobacco almost all his life, and his father before him, and he was well. He did not advocate its use in the young, but some it injures and others it does not, never mind how much they use it. His friend, Dr. Ridout, had lived to the age of 90, an inveterate chewer. He had also often seen cuts and wounds treated with great success with quids of tobacco. Dr. Cathell had brought forward no proofs of his statements of the injurious effects of tobacco, nor had he ever made any postmortem examinations of the fatal cases.

Dr. Cathell, in closing, said that the cases of Dr. Claude belonged to his first division of cases that were not injured by tobacco. He had not said that smoking and chewing could cause cancer or polypi, but that they could be the exciting causes of these troubles.

Dr. George J. Preston then read a paper entitled

SOME FACTS AND SUGGESTIONS CONCERNING THE CARE OF THE INSANE IN MARYLAND.

After reviewing what had been done in this State for the care and treatment of the insane, he spoke of the active part which this Society had always taken in all matters affecting the public health. Many of the insane, while technically classed as paupers, are really not such any more than are the accident cases in our emergency wards. The nature of the disease renders treatment at home impossible, and the duration of the disease makes it impossible for many to pay for treatment during the long course; and more than that, the man is dangerous to the public and must be confined. It follows, then, that the State must make better provision for this class of unfortunates than for the pauper class. Our advanced civilization demands more scientific and more humane treatment. Therefore the State should take care of her insane, not only because it is her duty, but because it is more economical to treat them properly and cure many of them than to have them a continuous burden. Therefore the State should assume entire control of all public insane within her borders; the acute and chronic insane should be separated. Also there should be at some central point, or in the large cities as at Baltimore, a detention hospital or ward where those becoming suddenly insane, the cranks of all kinds, could be confined until their cases are studied and a proper disposition is made of them. The station houses are not proper places for such cases.

Dr. Henry M. Hurd said that the insane should have State care; county care is only an excuse to economize. If the State deprives a man of his liberty, the State should take care of him as well as possible. He does not believe in dividing acute and chronic cases. He does not believe that any man knows who is curable and who incurable. We should have a detention hospital for the temporary care of the insane, and study these cases there and find out where they belong.

Drs. E. N. Brush, R. F. Gundry, S. J. Fort, Wm. Lee, B. D. Evans and C. Birnie all spoke of the manner of obtaining proper legislation on this point, and its great importance.

DR. WM. H. WELCH said the paper read was a most excellent one. He thought whatever was done, the insane should be used for medical educational purposes, and the general practitioner should know something of insanity. We should take no step that would throw the material away from Baltimore, and keep it from being used in teaching. The provision should not exclude the possibility of using the insane for clinical material.

DR. WM. LEE, Secretary of the Maryland Lunacy Commission, then read a paper entitled, "Advancements in the Care of the Insane in Maryland during the Past Eight Years; Insanity in the Colored Race."

As a result of these papers and the discussion, resolutions were passed, and a committee of twenty-five was appointed, to bring the matter in proper shape before the next Legislature.

DR. THOMAS H. BRAYSHAW of Glen Burnie, Md., then read a paper, "Is Psychic Research a Benefit to Mankind?"

DR. S. J. FORT of Ellicott City, Md., read a paper on "Psychical Epilepsy."

DR. H. M. HURD said he did not accept his nomenclature, nor did he agree with Dr. Fort in his conclusions; it is an unfortunate name for those not having epilepsy.

DR. E. N. BRUSH said he did not like the name, moral imbecility. Children may be educated too much and rest may help them. We may educate our imbecile into a criminal as he gets older.

SECOND DAY—WEDNESDAY, NOVEMBER 23.

Invitations were received to visit the Naval Academy, by Medical Inspector Thomas C. Walton; also from the Medical Association of the District of Columbia, which will celebrated its centennial next February. Dr. T. A. Ashby was appointed a delegate to represent the Faculty there.

DR. WM. H. WELCH then brought up the report of the National Quarantine Committee of the New York Academy of Medicine, on a Bill to Establish a Bureau of Public Health within the Treasury Department of the United States, and offered a resolution to appoint a committee to further the passage of this bill. The bill is very important, and has been prepared with great care and with due regard to the National Government and States' rights. The object of this committee is to further the passage of this bill, and coöperate with the committee of the New York Academy of Medicine. Resolutions were also passed appointing a committee to act in conjunction with the Medical Examining Board, to secure needed modifications to the Medical Practice Law.

DR. B. B. BROWNE then read a paper entitled, "Artificial Vesico-Vaginal Fistula for Examination and Treatment of Ureteral Diseases."

DR. H. A. KELLY remarked on the value of this paper, and said that where formerly we relied on touch and feel to explore the bladder, and even to catheterize the ureters, he had now taken up the plan of using the head mirror and throwing so much light into the female bladder through the speculum that every part of the interior of the bladder, as the pharynx under similar circumstances, was visible, and we could see with distinctness the openings of the ureters. He showed a series of photographs, demonstrating how easy it was to use the head mirror for this object, and how important it was for the general practitioner to get into the habit of using the newest methods of making examinations.

DR. T. A. ASHBY then read a paper on "Sterility Due to Tubal and Ovarian Disease."

DR. J. E. MICHAEL was much pleased with the paper of Dr. Ashby, and thought it emphasized the tendency of these times to save rather than destroy the organs of woman. This will be of great service in increasing the population. The theory of the fimbriated extremity grasping the ovary during ovulation was he believed an exploded one, although from the nature of things this was not certain. He thought that ovulation was rather by a current set up in the ciliated epithelium of the tube, and disease of the tube interfered with the action of this epithelium and ovulation did not take place. Ovulation and menstruation were not synchronous; ovulation goes on before menstruation begins at all. Many pregnancies occur before the establishment of menstruation.

DR. CHARLES P. NOBLE of Philadelphia, said it was time to recognize that sterility depends more on the ovary and tube than on the vagina and uterus, and if the uterus were more often left alone it would be so much the better. Abdominal surgery is much safer than it was, and this is the secret of many operations; it is not that the operator is more anxious to do the operation but that he can dare to do it. The combined work of Price, Dudley and Martin had been put down at two pregnancies, as the result of all their operations and it was a question whether these two pregnancies had anything to do with the operations. He had little faith that diseased tubes could ever amount to anything. We can save an ovary that is partly diseased. Some adhesions disappear of themselves and these may be of puerperal peritonitis. It was well to use palliative measures of treatment in these cases.

DR. H. A. KELLY said that Dr. Ashby struck the right keynote, or to be more classical, "rem acu tetigisti." It is very important that the general practitioner should know how to approach a case of sterility. No man should pronounce a woman sterile until he had examined her husband. Examine the semen. Impermeability of the os uteri is often the cause of sterility and a simple dilatation will effect a cure. In some cases he has found small tumors pressing on the tube and presenting an obstacle to the passage of the ovum. Dr. Ashby, in closing, said the question of the physiology of menstruation was a speculative one in the human being, but we can learn much from comparative anatomy. He does not believe in opening the abdomen by way of experiment.

DR. H. A. KELLY reported thirty-nine cases of removal of the uterus; some by the vagina, some by the abdomen, with one death which was not due to the operation but to septic catgut. The earlier work had been done by the clamp method, drawing out the tumor, putting on the clamp and leaving it there until the wound had healed. Then there was the combined extra- and intra-peritoneal methods. The abdomen was opened, tumor lifted out, vessels tied, stump cauterized to prevent sepsis and then fastened to the lower angle of the wound. He thought that the unilobular tumors were more common in women who had borne children. He operated for good reasons only. His present method was to first make an incision, then to put on ligatures to stop the hemorrhage as he was operating. He had noticed that the tumor seemed to take the shape of the pelvic canal when it was situated there. There were only four large arterial trunks feeding the tumor and two were reached at once. The broad ligament was pulled aside by the fingers. He took great care not to get the contents of the uterus and cervix on the stump, and always disinfected the stump with the cautery, or he cut it off and left it cup-shaped. He put in a few silk ligatures in the stump, cleaned out the abdomen although it should never have a chance to be otherwise than clean, stopped oozing of small veins, cut off ligatures and dropped the stump back into the abdomen, turning the pedicle upside down so that the bladder is exposed to view

DR. CHARLES P. NOBLE of Philadelphia said that the subject of the operation on fibroid tumors was of great interest just now to gynecologists. Formerly it was thought that they were innocent things that were never cured and should be left alone, as it was supposed that they disappeared at the menopause or did no harm. This teaching is undergoing revision and it no longer holds. The menopause is often put off in such women to the fiftieth or fifty-fifth year and it is very discouraging to tell a woman of thirty that she must drag on for twenty or more years with no help. Many do not cease to give trouble, even at the menopause. The first five cases he had operated on were of this kind. These patients are great sufferers. He thought that a tumor that weighed five pounds could be called a large one; a two pound tumor in the pelvis will fill it and he had never seen a fibroid that weighed more than eight pounds. In all the operations he had done, where the stump was left in the angle of the wound, hernia had resulted. The method of operating has been developed by many surgeons. He did not advocate using the ligatures in the cervix, and thought it was unnecessary to put on the ligatures in the vagina, and he does not think there is any use in cupping out the cervix. He did not think that we removed enough fibroids. Why should we leave a fibroid in to grow large? It is safe surgery to remove it and we should do it.

DR. J. E. MICHAEL thought that gynecologic operations were like other surgical operations and advanced and changed in the same way, and there was no excuse for always keeping in the same rut.

DR. H. A. KELLY closed by saying, that he had been asked once in court as an expert witness, what a large tumor was, and he replied that a tumor was large when it pressed on the parts. A tumor that is large in the pelvis may not necessarily be large in the abdomen.

DR. HUNTER ROBB read a paper entitled,

GYNECOLOGIC OPERATIONS OUTSIDE OF HOSPITALS

in which he gave specific and minute directions how to perform an operation outside of hospitals, and what assistance and what else was necessary to success.

Dr. W. S. Gardner thought also that operations could be done as well outside of hospitals as in, if care be taken. In cases where you have large collections of pus and where much irrigation is needed it is not advisable to operate at home. He does not believe that wounds become infected from the atmosphere. He does not think it is necessary to take our sterilizer with us, as the sterilization can be done at home before starting, and if the instruments, sponges, etc., be kept in the cotton in which they were sterilized they will be clean. It was just as well to have plenty of sterilized water at hand but it was rarely well to use it.

Dr. Julius Friedenwald read a paper on "Atony of the Stomach."

Dr. Milton D. Norris read a paper entitled, "Subcutaneous Infusion of a Nutritive Salt Solution in Cases of Refusal or Inability to take Food," in which he reported his experience in feeding cases at Spring Grove Asylum with good results.

This paper was discussed by Drs. Brush, Evans, Gundry, Branham, Rohe and Fulton.

Dr. C. Birnie then read a paper entitled,

WATER SUPPLY, ISOLATION AND DISINFECTION IN COUNTRY DISTRICTS

in which he showed the carelessness of country people in respect to their drinking water and disposal of their sewage, and the filthy way they arranged their water closets. The suggestions in this paper were practical and simple, and his experience was a valuable one.

Dr. George H. Rohe said if he dared to make a comparison he would say that this was the best paper of the session.

Dr. Canfield said he thought the paper was to be commended for the practical nature and for the simple nature of the suggestions; he thought this was the age of preventive medicine and we needed just such papers as this. The paper was further discussed by Drs. Hines, Evans and Brush.

Dr. W. T. Howard, Jr., read a paper on "Hemorrhagic Septicemia," which was discussed by Dr. J. Friedenwald.

Dr. John S. Fulton of Saulsbury, Md., exhibited

AN APPARATUS FOR THE ESTIMATION OF UREA

which was superior to any instrument yet shown, and which with a little practice could be used by the general practitioner. This was discussed by Drs. J. Friedenwald, Canfield and Fulton.

Dr. Edward Anderson of Rockville, Md., read a paper on "Obstruction of the Bowels."

Dr. Fred J. Dunning of Easton, Md., in his

GLEANINGS FROM A COUNTRY PRACTICE,

reported a supposed case of yellow fever, with the difficulties attached to daring to make such a diagnosis or failing to do it in a crowded community. He also reported his first case of abdominal section.

His paper was discussed by Drs. Canfield, J. Friedenwald and Fulton.

College of Physicians of Philadelphia.

SECTION ON ORTHOPEDIC SURGERY.

Meeting held on November 17, 1893.

Dr. J. B. Deaver exhibited a patient showing the result of

SUBCUTANEOUS OSTEOTOMY OF THE NECK OF THE METATARSAL BONE, FOR HALLUX VALGUS,

and gave the history of the case.

Dr. H. Augustus Wilson opened the discussion by exhibiting a cast of a similar case in which there was extreme hallux valgus of the right foot, the metatarsal bone being decidedly pushed from the normal position underneath the second biceps. It was originally the intention to amputate the toe. A bursa was present on the right foot, and this was found to be a segment of the joint, which he had opened thinking it a corn or a bunion. The pain was excessive.

Dr. T. G. Morton—The cases of this form of toe distortion which have come under my care have generally been accompanied by serious joint disease, so much so, that excision of a wedge including the entire articulation was required. I have never performed osteotomy which is at once so simple and efficacious for the modern forms of the malady. I believe that in the great majority of cases that the operation as performed on the patient before us, which has been so eminently satisfactory, is all that generally would be required.

Dr. G. G. Davis—Dr. Deaver speaks of the shape of the shoe as being the cause of the deformity, but I can not fully agree with him. In some of these cases there is a marked rheumatic element. I do not think it is *always* produced by pressure. I can not believe that an ill-fitting shoe, alone, in all cases, produces it. There is often some rheumatic condition in the neighborhood of the joint.

Dr. J. B. Deaver—In answer to Dr. Morton, I confess I have not done osteotomy on so pronounced a case as the one referred to, but my deductions from the literature on the subject and from my experience with the operation, are that it would fulfill the indications in the case referred to. I have no doubt of its superiority over amputation and that we can promise the patient a good result. We all know there is a great objection to amputating the great toe, therefore the more conservative operation is the better one if it can be done. We also need to note the absence of adhesions in the joint after osteotomy.

In my own case, the condition was the result of a frost bite, but I believe with Dr. Davis that a rheumatic element is to be considered. In any case where the deformity exists, the sooner it is corrected, the better. I do not believe in any of the ordinary appliances; all of them are unsatisfactory; they make the shoe large and unwieldy and simply add to the existing deformity. The operation is not attended with any risk. We all have operated upon cases of knock-knee where there was greater deformity, and made good corrections. Dr. Wilson's illustration of the prominent head of the metatarsal bone being mistaken for a bunion, only shows how careful the general practitioner should be, and in any case of doubt refer it to an authority.

Dr. T. G. Morton brought before the Society a very unusual instance of general bodily deformity, with ankylosis of the spine, upper and lower extremities, etc., in which he asked the attention of the members as to the possibility of any operation affording improvement, and gave the following brief history of the patient:

In July last I received a note from Dr. Wright of Gipson, Ala., asking for permission to send to the Orthopedic Hospital a case of deformity in an adult which was thought could be improved. As it was impossible to obtain an exact description of the case, the patient was allowed to come North, and accordingly started on his journey; first riding fifteen miles in an ox-team to the railroad, then without change to this city. He was so deformed that he had no use of his lower extremities and was confined in a sitting posture in a rude, home-made chair which he constantly occupied. The following notes of the case were taken by Dr. Walker of the Hospital:

Family History.—Amos C. G., age 32, of Gipson, Ala. Parents living. Father age 55, has had rheumatism from boyhood. Mother age 65 years, suffers almost continually with neuralgia. Two brothers living, both have had rheumatism.

Previous History.—Patient was well until ten years old when he had an attack of rheumatism commencing in the right hip joint; the knee joint of the same limb was involved, then the ankle, and later the joints of the left lower extremity, spinal column, and finally both shoulders, elbows, wrists, and to a less degree the fingers and toes. The extension as above described occupied a period of over three years, during which time he suffered intensely and could be moved only with great difficulty. Joints were hot and swollen, fever moderate. His limbs were in one position during all this time, though not then ankylosed; he says that he could move but the effort caused him intense pain. At the end of three years, 1874, the pain became less acute, gradually lessening until 1885, at which time he says no rheumatic pain remained but the joints were stiff as at the present time.

During the years of his first attack (from 1871 to 1874) he spent much of the time in an ordinary chair, leaning upon the arm of the chair which was placed along side of him, this position evidently accounting for the lateral curvature and some of the deformity of the trunk now seen. In 1874 he had a chair made of the same pattern as the one now in use, but for a time had to support the greater part of his entire weight by the arm pieces (two pins, one beneath each shoulder joint) because of the pain in the hips and spine if those joints were subjected to any strain. This would explain deformity (elevation of shoulders).

This chair was made with a cross piece passing beneath the knees for support. Femora found curved at this position. In 1886 had another attack of rheumatism affecting principally the shoulder joints and those of the neck. Several joints have been affected at different times since then.

Present State.—Head normal in shape and size; wears a 7⅛ hat; trunk undersized and misshapen, antero posterior and lateral curvature of the spine which is perfectly rigid; legs flexed on thighs, almost in contact; thighs on pelvis and in contact with the abdomen; and pelvis upon the thorax, the anterior superior spinous processes of the ilia being almost in contact with the lower ribs; all the joints of the lower extremities are firmly ankylosed, with the exception of the phalanges.

The right arm can be bent at an angle of 45 degrees with the shoulder. The left elbow is fairly ankylosed, no pronation or supination. The left arm can be brought to a right angle with the trunk at the shoulder; left elbow firmly ankylosed at a right angle; pronation and supination normal; wrist and phalangeal joints normal.

Weight, 52½ pounds; measurements, height from top of head to lowest part of body as he sits in chair, 22 inches; right calf, 5⅝ inches; right arm, 5¾ inches; left arm, 4¾ inches; right forearm, 6 inches; left forearm, 4¾ inches; appetite fair; digestion well performed, tendency to constipation; heart, liver and lungs normal; urine highly acid, sp. gr. 1030 excess of urates; no abnormal constituents.

I shall be glad for the members of the Society to examine this patient, and then to give their views as to the possibility of any good being attained by operative interference. From a careful study of this case I feel that little if any improvement can be secured by any operative treatment on account of the inability of the man to use his arms to any extent, the ankylosis of the spine which precludes any movement of the body, and finally the excessive atrophy of the lower extremities, which, even if brought out straight, would not support the weight of the body. Probably the best that can be done will be to give him a suitable apparatus to support his arms as an attachment to a proper spinal brace.

DR. H. AUGUSTUS WILSON said—Dr. Morton speaks of the possibility of reproducing one of his successful experiences, and, after bringing the legs down, of adjusting artificial limbs. It seems to me that osteotomy in this case would be an unwarrantable procedure; even if the legs were brought into good position, the curvature of the spine, the rigid pelvis and the position of the head to one side, would make the result one of disappointment even if osteotomy in itself were successful. I am rather of the opinion that a wheel-chair would be the best thing for him. He has probably sufficient motion of the shoulders and hands to enable him to move a chair about. Something similar to the chair he now uses, with wheels added, would be a wise arrangement so that he could have more freedom of motion. The outdoor life thus induced, as well as the movements of the arms in propelling the chair, would be decidedly beneficial. In the sitting posture he could adopt some occupation by means of a movable shelf attached to the chair, and thus relieve the strain of idleness.

DR. FRANK WOODBURY—Rheumatism in children is not a very rare affection, but this patient presents conditions rarely met with, and is a most interesting case. Probably it would be more correct to regard it, not as a case of rheumatism but as an illustration of arthritis deformans in an advanced stage of the disease. As the patient is now 32 years of age and has been suffering for twenty years, or more, the long course of the disease would be against any marked benefit arising from an operation, especially as there is only infantile development of the lower extremities. Regarding it as chronic arthritis, we recall the fact that in these cases, cod-liver oil, massage, gymnastics, hot applications, and electricity to improve the muscular tissues, are able to accomplish much good. By directing such treatment, especially to the upper extremities, he might gain sufficient range of motion to feed himself or to propel himself in a wheel-chair, and get more comfort out of life. It must, of course, be determined, surgically, whether there are any fibrous adhesions in the elbow or shoulder joints which could be broken up by forcible flexion, but as regards anything more in the way of operation, I think that more radical measures might safely be postponed until the limit of improvement by the treatment just outlined has been attained. Certainly a six months' course of medicine would put him in better condition for operation, even if it were determined that such procedure was necessary.

DR. G. G. DAVIS—What struck me in looking at this case is the fact that the patient appears to be in a moderately healthy condition and would very likely stand operative procedures well. It would be a great gain if he could be made to stand upright. Failure might arise, of course, from sepsis, etc., but the advantages from straightening the extremities would be so great, and his health appears to be so good, and the danger from osteotomy so small, that I would think some operation might be undertaken. His condition could hardly be worse and he might possibly be benefited—to what extent I am unable to say, but it might be worth the attempt.

DR. H. R. WHARTON—I would like to ask Dr. Morton if he would have any hesitation in giving this man an anesthetic? It seems to me that I should have some anxiety in doing so. So far as osteotomy is concerned, certain correction might be made, but I do not really see how the condition of the patient could be much improved. I do not think much motion could be obtained. I am inclined to think that the judicious course would be to make him comfortable by a mechanical contrivance. I have had considerable experience with osteotomies, and the wounds usually do well, but in some conditions of the tissues, sloughing occurs, and the patient is very sick from the operation itself. I should be rather inclined not to operate.

DR. DEFOREST WILLARD—In my judgment it would be doubtful whether the patient would be able to manage artificial limbs, even if his legs were put into good position. Necessarily the artificial legs would be heavy, and I doubt whether he would be able to balance himself, since his back and neck are so rigid. Osteotomy is an operation simple in itself, and not attended with any special danger.

I know of a case in this city, not quite so much deformed as this one, but having its origin in rheumatoid arthritis. It did not occur so early in life, but otherwise it is quite similar to this one. Nothing could be done for the patient. Another is that of a man so much deformed that he has lain in bed for twenty years. The disease in him is aroused by any attempt at motion of the joints.

DR. J. B. DEAVER—I should hesitate to change the topography of the blood vessels on account of cardiac diathesis. Several osteotomies would have to be done, and it is a question in my mind whether any great gain would be secured. The bones are particularly small and I question whether they would be able to endure any weight, even if they were straightened.

DR. T. G. MORTON—In again referring to the question of anesthetic, I would like to ask if any of the gentlemen would fear to administer ether in such a marked case of spinal curvature; especially in so serious a case. The only sudden death under ether that I have ever witnessed was in a patient at the Pennsylvania Hospital; within thirty minutes after operation the patient died from edema of the lungs, very suddenly. My own feeling is that there would be a great risk in this case, and that the suggestion of a wheeled chair is the best plan to follow.

(*To be continued.*)

Vermont State Medical Society.

Eightieth Annual Meeting—Held in Rutland, Oct. 12 and 13, 1893.

Reported by DR. D. C. HAWLEY, Secretary.

SECOND DAY—MORNING SESSION.

(*Continued from page 903.*)

DR. T. D. CROTHERS of Hartford, Conn., read a paper entitled,

MEDICAL TREATMENT OF INEBRIETY.

The following is a brief summary of his paper:

"The disease of inebriety, like other diseases of the brain and nervous system, follows a uniform movement, controlled by laws of dissolution, and conditions and causes that can be determined. Locks and bars, pledges, chemic restraint by drugs, appeals to diseased higher brain sections, appeals to the credulity and disordered senses and emotions, by 'gold cures' or specifics, are all empirical. Our central object of all treatment is to restore the organism, so that the narcotic of alcohol or other drugs will not be demanded.

"The disease of inebriety follows a uniform line of events, from certain special causes and conditions. The prognosis and treatment depend altogether on a clear apprehension of the case. The first thing is to place the patient in the most favorable conditions for cure, where all his surroundings can be helpful, and the best means applied to build up

and restore his brain and nervous system. This may be done in an institution, or at home under the care of a nurse.

"The withdrawal of spirits and the use of baths and massage daily, with brain rest, are essential. Remedies, such as the bitter tonics, mineral salts and acids, nux vomica and often bromids and iodids are valuable.

"The use of nutrients, with rest and baths, fulfill most all the demands of each case. Reconstruction of cell and tissue is the object to be sought. Restraint, protection, liberty, and the application of means to meet all the demands and abnormalities must be applied.

"The entire subject must be studied from a higher level and along the line of accurately observed facts."

THE SURGICAL TREATMENT OF HEMORRHOIDS,

was the title of a paper read by DR. D. C. HAWLEY of Burlington. He said: "In all severe cases of hemorrhoids, surgical treatment is the most satisfactory. The arteries and veins of the lower portion of the rectum run nearly parallel with the long axis of the gut; hence it is that a longitudinal incision rarely causes much hemorrhage.

"The principal methods of operating are four in number: 1, by ligature; 2, by the clamp and cautery; 3, by excision; 4, by crushing.

"The bowel should be thoroughly emptied and the parts about the anus scrubbed, shaved and washed with carbolic solution. In all cases, the sphincters should be thoroughly but carefully dilated."

After describing in detail the various methods of operating, and the after treatment, he said: "The patient should be kept strictly in bed for about ten days or two weeks; then may gradually during the next week exchange the bed for a reclining chair or lounge. Complete recovery usually requires about three weeks, and I consider *time* an all-important factor in the after treatment. Patients should not, as they are often allowed to do, get up and go about in ten days or two weeks, as thereby congestion of the hemorrhoidal vessels is favored, healing is delayed and perfect recovery is retarded and perhaps prevented.

"No one method can be claimed to have advantages in all cases over any other, and the proper selection of an operation depends upon the good judgment of the operator. The operation by ligature is probably the safest, as it is the simplest (requiring no special instruments), and involves least risk of after hemorrhage. It is best in case the patient is anemic and where the tumors are large and vascular.

"Pain after the operation depends more upon whether or not a portion of the skin has been cut or burned, than upon the method employed. Hemorrhage at the time of operating is sometimes troublesome, when the clamp and cautery are used.

"Whitehead's operation is, in my opinion, seldom indicated."

A paper on

APPENDICITIS

Was presented by DR. J. B. WHEELER of Burlington.

The following is a brief summary:

1. Among male patients, the great majority of all cases of peritoneal inflammation originate in appendicitis.

2. In spite of the fact that many cases are mild and recover spontaneously, the death rate of medically treated appendicitis is very high, and the list of recoveries contains many cases which afterward recur.

3. The death rate of appendicitis treated by timely surgical operation is very low, and the cures are complete and permanent.

4. The late operation for appendicitis is a last resort, and like all operations done in extremis, has necessarily a high death rate. Moreover, cases which recover after a late operation are in less satisfactory condition, and have a much longer convalescence than cases treated by early operation.

5. In the beginning of a case of appendicitis we are unable with our present knowledge of the disease to predict the end.

6. Until our prognosis has greatly improved in accuracy, the safest general rule for the treatment of appendicitis, is to remove the appendix as soon as the diagnosis is satisfactorily established.

Adjourned.

SECOND DAY—AFTERNOON SESSION.

DR. O. C. BAKER of Brandon, read the next paper,

DIAGNOSIS AND TREATMENT OF EMPYEMA.

He said: "I shall speak only of empyema as pus in the pleural cavity, and not in the general sense of the term. A wrong diagnosis, as a rule, means death to the patient, and I would suggest in all cases of doubt that we explore with the hypodermic needle. Pus in the pleural cavity demands immediate evacuation. The treatment is included under three heads: aspiration, free opening with or without a drainage tube, and rib section. The results of aspiration are disappointing. Free incision with drainage is often very satisfactory, and gives good opportunity for washing out the cavity."

DR. GEO. RUSTEDT of Shrewsbury, read a paper on

PURPURA HEMORRHAGICA, WITH REPORT OF CASE.

The patient, a girl, aged 11 years, suffered in March, 1880, with uterine hemorrhage, which was controlled in a few days. Four days later severe epistaxis supervened, which was very stubborn, and accompanied with livid spots, of variable size over body. This condition continued at intervals until June, and then subsided. The epistaxis returned in the spring of 1883, with increased vigor, when there was dilatation of heart, swelling of extremities and slight albuminuria. The case again yielded to treatment and she enjoyed fair health until autumn of 1886, when a slight attack of epistaxis came on and was easily controlled. On the following morning was summoned in haste to the patient and found her dead, there having been, however, no return of bleeding. The family history shows that one paternal uncle was taken suddenly with severe pain in elbow and died in two days, and another had a tooth drawn at night and was taken with pain and swelling of jaw and died in three days.

A paper on

THE USE OF CHLORAL HYDRATE

Was presented by DR. J. B. WOODHULL of South Shaftsbury.

He said: "Chloral produces sleep that is like natural sleep. The patient wakes without headache, has not been troubled with bad dreams and is refreshed. I usually prescribe chloral with an equal quantity of potassium bromid, and a very small dose—one-twentieth grain—of morphin. I have had marked success in the treatment of vomiting of pregnancy, with the above combination. I have had no trouble with patients forming a 'habit.' I never tell patients what they are taking; as soon as you do so there is danger."

The following papers were read by title only:

"Thoughts Regarding Heart Failure (so-called)," by Dr. E. V. Trull of Manchester; "Hypnotism," by Dr. Geo. B. Hyde of North Hero; and "Denuded Cranium; Its Treatment by Perforation of the External Table of the Skull, and Thiersch Method of Skin Grafting," by Dr. E. M. Pond of Rutland.

The report of the Committee of the AMERICAN MEDICAL ASSOCIATION on Revision of Constitution, By-Laws and Code of Ethics, was considered and was approved by an unanimous vote.

American Electro-Therapeutic Association.

The Third Annual Meeting Held in Chicago, Sept. 12, 13 and 14, 1893.

AUGUSTIN H. GOELET, M.D., President.

Continued from page 906.

THE NUTRITIONAL EFFECTS OF STATICAL ELECTRICITY, CONSIDERED IN RELATION TO HIGH FREQUENCY, HIGH POTENTIAL CURRENTS, AND THE TRANSPARENCY OF THE DIELECTRIC.

WILLIAM J. MORTON of New York, said: "I have not had time to write a formal paper, and will therefore communicate orally what little I have to say. I have had prepared a number of tables which in reality contain the pith of the intended paper. They represent the work in this direction done in my clinic at the New York Post-Graduate Medical School and Hospital.

I believe there is a greater unanimity among electrotherapeutists in favor of Franklinization than ever before, and that there is yet much to be said in favor of this modality of electricity in medicine. I remember the day when it was said that this static form of electricity resided upon the surface, and could not penetrate beneath the skin, and that therefore it was of no value whatever, as it did not reach any of the tissues or organs. It was not long ago when Moebius said that most of the effects of electrical treatment were due to "suggestion," and particularly was this the case with statical electricity.

I am inclined to think that statical electricity will always remain as a useful therapeutic measure on a par with faradization and galvanization; but the trouble has been to convince ourselves and others that there was this power in

it. It is to the objective evidence of the physiologic effects resulting from electro-statical treatment that I would now invite your attention.

Let me point out the new relations which statical electricity has assumed to electro-therapeutics through the labors of a certain small number of men during the last two years. It is by the reflected light coming from the brilliant labors of D'Arsonval, Tesla and Elihu Thompson in developing the high frequency high potential current, that we are enabled to say why it is that electro-statical treatment is so beneficial.

All along we were dealing with a beautiful principle of which we were not fully aware—that magnificent principle in Nature that intermitting energy has an enormous power; that things which have wave movements are those which are exhibiting power. Thus, light, heat and electricity are vibratory motions. The statical form of electricity is an oscillating or wave motion due to the oscillation between the electric charges set up in one vicinity and those set up in another vicinity.

Now, what is the present situation in regard to these high frequency high potential currents, and how is it that statical electrization can be brought into this category? The high frequency high potential current is simply a periodical current, where the electrical energy is cut up into waves or periods. If these periods are very frequent—10,000 to 100,000, or even 10,000,000 per second—then we have a high frequency current in contra-distinction to the low frequency currents obtained from the ordinary faradic coil. With this high frequency is a correspondingly high electro-motive force. It is electro-motive force and not electrolytic conduction which is doing the work. It has been said here today that there is no action on the human tissues except there is chemic decomposition, but this is not so. There is an action on the human tissues which has nothing to do with chemic action, and that is what we are talking about in describing the effects of statical electricity.

The relation between these high frequency currents and the statical electricity is easily explained. If we suspend a Leyden jar in connection with any electro-static machine, and cause a spark to pass, every time the spark passes there is a discharge of the Leyden jar corresponding to the spark, and oscillation takes place many thousand times per second. Generally these oscillations of the discharge vary from 100,000 to 1,000,000 per second. This is the periodic current with which we are dealing in electro-statics.

Whether you use the Leyden jar or not, the result is the same. If there is a plus charge on one prime conductor and a negative on the other, on approaching the rods there is a spark discharge, and at this moment there is exactly the same oscillating current produced. This oscillation varies according to the resistance in the circuit. If the resistance be great, the oscillations are reduced, perhaps even so much that the oscillations may be appreciated by the ear as a musical tone. If there be no such resistance, you have a high frequency current, whose capability to penetrate the tissues seems to be without limit.

In that remark we have the answer to the criticism that electricity resides on the surface, and does not penetrate the human body; for the resistance of the human body is as nothing against that of the particular form of the current. As the static machine is set in motion, every particle of ether is set in motion in the room, and the same vibration is set up in our own bodies. How strong that electrical influence may be is another matter; that it is strong I shall endeavor to show in the tables which I have prepared.

In addition to the familiar mode of electric conduction, we must remember, 1, that there is an electro-static field; and, 2, that portions of the human tissues are dielectrics when in the neighborhood of an electrical discharge.

That there is an electro-static field in contra-distinction to an electro-magnetic field may be easily demonstrated experimentally. For instance, the space between the prime conductors is the electro-static field, and if you put a patient in that field, he is affected by "the lines of force" passing through him. It is only a question of how strong that field is and of its oscillations, to determine the effect on the human being brought under its influence. That this field is one of mighty energy can be demonstrated by bringing an incandescent lamp into the field, when it will be seen to glow.

We must, therefore, adopt the mechanical view that the electrical energy which produces what we call "the current" is *around* the wire, and not entirely in the wire; and that the wire is not a conductor as a pipe is of water, but the electrical influence is felt in the medium around the wire. If this is not a conductor, then these same ether vibrations impinging on the dielectric put it in a condition of strain. If that strain were maintained, and the charge did not change, nothing would happen. But the discharge is first plus and then minus, and the surging movement is taking place thousands of times per second. By a dielectric I mean a non-conductor having a charge and in relation to another body having a charge.

We say that the non-conductors are "transparent" to periodic currents and "opaque" to constant currents. It will be found that these periodic currents are conveyed by our non-conductors. This important fact is demonstrated when you insert in a telephonic circuit a condenser; it is impervious to a constant current, but transparent to the periodical current. The human body may be regarded as under two influences—the one where electro-static alternations are dissipated upon the conductors as a current, and the other where they affect the dielectric and still act as a current.

Now, as to the effects on nutrition. The patient may receive an electric bath for fifteen minutes, and the hard, striking spark for about five minutes—this is a customary treatment. Many have not had much faith in the actual effect of such treatment, and for this reason I have endeavored to collect evidence on this point.

The spark or bath causes augmentation of the circulation. The spark when given along the spine causes a dilatation of the peripheral vessels, and the circulation is visibly increased. The patient frequently breaks out into profuse perspiration. If you will apply to a person's bare arm a long spark, you will see the spot is dead white; this is because there has been an instantaneous vaso-motor constriction; but some minutes later, you will find it intensely red as a result of the secondary vaso-motor dilatation. This on a small scale represents what on a larger scale takes place through the entire organism of the patient.

It has been stated in our books that statical electrization increases the pulse from fifteen to twenty beats, but my clinical observations show that in certain cases the pulse may be uniformly diminished as well as augmented. (See tables.) The change in the pulse depends upon the nature of the disease. Many neurasthenic cases have a sub-normal temperature, and immediately after treatment there is usually an elevation of the temperature of from half to one degree. In a general way, it may be stated that the disposition of statical electrization is to produce an equalization from the centers—reducing a high pulse, and elevating a sub-normal temperature or elevating a low or normal pulse and reducing a temperature above normal. If both pulse and temperature are above normal both will be reduced.

Case 1.—Mr. C. R., age 49; occupation, actor; diagnosis, tabes dorsalis; treatment, static induced.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
April 25, 1892	98	98	92.2	98.4
" 27, "	100	106	98.8	98.4
" 29, "	99	102	99	98.8
May 4, "	92	86	99	99.2
" 11, "	116	98	100.2	98.8
" 13, "	102	104	99	98.4
" 18, "	104	108	99	99.2
" 20, "	98	101	98.5	98.5
" 25, "	100	100	99	98.9
" 27, "	81	110	98.6	98.8
June 8, "	104	104	98.8	99.2
" 10, "	103	103	98.3	98.4
" 15, "	100	104	98.2	99.2
" 22, "	102	102	99.2	99.4
" 24, "	104	102	99.2	99.2
" 29, "	102	102	98.6	98.4
July 1, "	100	98	99.4	99
" 6, "	94	102	99.2	99.1
" 8, "	104	108	99.4	99.2
" 13, "	102	114	99.6	99.4
" 15, "	108	116	99.4	99.6
" 27, "	100	114	99.7	99.4
Aug. 10, "	100	104	99.6	99.4
Sept. 2, "	92	104	99	99.4
" 9, "	106	106	99.4	99.2
" 16, "	89	104	99.4	99.6

Remarks.—Upon admission to electro-therapeutic clinic, Post-Graduate Medical School and Hospital, Dec. 16, 1891, had incoördination of movement in legs, slight in arms. Lightning pains; swaying with eyes closed; thickness of tongue; halting speech; knee reflexes absent; cramps in legs; urination difficult; fingers numb; pupils do not respond readily to light. Weight, 93 pounds.

June 29, 1892. Weight, 113 pounds, gain of 20 pounds. Stands steadily with eyes closed; no pain; locomotion less difficult; no thickness of tongue; speech improved. Pulse raised; temperature lowered.

Case 2.—Mrs. E. R., age 43; occupation, domestic duties; diagnosis, neuritis left brachial plexus; treatment, Franklinic current, positive insulation, long percussive sparks to distribution of left brachial plexus.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
April 1, 1892	84	80	99.4	99.4
" 8, "	99	85	99.2	98.5
" 22, "	90	74	99.8	99.8
" 27, "	80	76	99	99.4
May 11, "	96	80	99	99.8
" 13, "	90	70	99.4	99.4
" 18, "	78	82	99.8	99.8
" 20, "	76	65	99.6	99.6
" 27, "	70	64	99.2	99.2
June 29, "	72	76	99.2	99.6

Remarks.—Pulse lowered uniformly; temperature little affected.

Case 3.—Mr. W. R., age 33; occupation, gasfitter; diagnosis, transverse myelitis, with spastic paraplegic symptoms; treatment, Franklinic current, positive insulation, long percussive sparks to spine, nerve trunks and distribution.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
May 13, 1892	102	98	99	98.8
" 18, "	98	108	99.8	99.6
" 20, "	90	94	99.1	99.6
" 25, "	100	98	100	99.6
" 27, "	102	104	99	98.8
June 15, "	80	80	99.2	99
" 29, "	80	88	98.6	98.4
July 1, "	88	88	98.8	98.7
" 15, "	86	81	98.8	99.1
" 20, "	88	92	99	98.9
" 22, "	84	85	98.4	99.2
" 29, "	80	96	99	98.8
Aug. 5, "	90	96	98.8	99.2
" 24, "	92	84	99	99.2
Sept. 2, "			101.4	101.2

Remarks.—Free perspiration always during treatment; gain in weight. Recovered.

Case 4.—Mr. J. W., age 35; occupation, soldier; diagnosis, double sciatica; treatment, Franklinic current, positive insulation, long percussive sparks to lumbar and sacral plexes, to both sciatic nerves and distribution.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
Mch. 18, 1892	82	82	99.4	99
" 21, "	85	74	98.9	98.2
" 30, "	76	84	98.8	98.4
April 1, "	72	72	98.4	98.2
" 6, "	80	78	99	98.8
" 8, "	79	64	98.6	98.5
" 11, "	72	68	98.4	98.2
" 18, "	78	65	99	98.4

Remarks.—Free perspiration during treatment. Pulse lowered; temperature lowered *every* treatment.

Case 5.—Mr. E. W., age 37; occupation, nurse; diagnosis, sciatica right; treatment, Franklinic current, positive insulation, long percussive sparks to lumbar and sacral plexes, right sciatic and distribution (pain) and to general surface (nutritional).

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
April 27, 1892	72	72	98.6	98.4
" 29, "	80	80	98.6	98.4
May 6, "	68	78	98.2	97.8
" 13, "	74	76	98.4	98.4

Remarks.—Six treatments; nutritional gain; recovered. Pulse little affected; temp. lowered except when normal.

Case 6.—Miss E. McM., age 25; occupation, domestic; diagnosis, left inter-costal neuralgia; treatment, Franklinic current, positive insulation, long percussive sparks to painful points (neuralgia) and to general surface (nutritional).

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
May 11, 1892	120	110	99.8	100.4
June 8, "	122	104	102.3	100.3
" 10, "	90	88	100	100.3
" 15, "	96	80	100	100
" 17, "	100	88	100.2	100.6

Remarks.—Pulse full uniformly; temperature not much affected.

Case 7.—Mrs. M. E., age 54; occupation, bookbinder; diagnosis, paralysis agitans, hemiplegic type; treatment, Franklinic current, positive insulation, long percussive sparks to spine, flexures of joints and all muscles.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
Mch. 30, 1892	80	74	99	99
April 1, "	72	74	99	98.8
" 6, "	68	68	99	99
" 29, "	72	67	99.2	98.6
May 13, "	76	70	99.2	99
" 20, "	66	63	98.8	97.8
June 15, "	80	78	99.6	99.5
" 22, "	72	72	99.6	99.2
" 24, "	72	78	99.1	99.8
" 29, "	76	70	99.2	98.8
July 1, "	78	76	99	99
" 6, "	77	67	99.5	99.3
" 13, "	78	94	99.8	99.2
" 15, "	80	82	99.7	99.6
" 20, "	88	82	99.8	99.2
Aug. 5, "	78	80	99.2	99.3
" 10, "	78	80	99.4	99.6
" 12, "	82	84	99	98.8
" 17, "	100	90	99.2	99

Remarks.—Gained 10 pounds. Pulse lowered eleven times, raised six times; temperature lowered.

Case 8.—Mr. W. H. B., age 59; diagnosis, neurasthenia.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
Feb. 22, 1893			97.4	98.4
Mch. 2, "			96.8	98.4
" 4, "			98	98.8
" 7, "			97.2	97.8
" 9, "			97.1	98

Remarks.—Sub-normal temperature uniformly raised; pulse not recorded.

Case 9.—Mr. W. A. H., age 57; diagnosis, (hypermetrophic astigmatism) neurasthenia.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
April 6, 1893	88	88	99	98.4
" 10, "	80	84	97.7	98.4
" 11, "	80	96	98.3	98.8
May 3, "	96	88	97.4	98.4
" 5, "	116	96	96.9	99
" 8, "	82	88	97.6	98.4
" 9, "	88	84	97.5	98.2
" 11, "	112	92	97.3	98.3
" 13, "	92	82	97.2	98
" 15, "	84	84	97.3	98
" 18, "	96	88	97.6	98
" 22, "	92	88	98.3	98.7
" 26, "	100	86	97.8	98.3
" 27, "	92	86	98	98.8
" 29, "	96	88	97.6	98.3
" 31, "	96	88	98.4	99
June 1, "	84	92	97.8	98.6
" 2, "	96	88	98.2	98.6
" 6, "	112	100	98.3	
" 7, "	104	84	97.8	98.6

Remarks.—Average pulse above normal; lowered; temperature sub-normal; raised; pulse lowered, temperature raised, sub-normal; remarkable uniformity of raising a sub-normal temperature.

Case 10.—Mr. J. H. F., age 55; diagnosis, neurasthenia.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
Jan 24, 1893		72	97.2	98.2
April 4, "	70	76	98.4	98
" 11, "	96	98	97.8	98.3
" 13, "	96	88	98.4	98.6
" 18, "	74	76		
" 19, "	68	70	98	98.2
" 25, "	88	72	98.6	98.4
" 30, "	96	72		
May 7, "	84	68		
" 14, "	80	72	98.4	98.8
" 23, "	76	72		
" 28, "	76	68		
June 4, "	84	76	98	98.8
" 16, "	76	68		

Remarks.—At first, pulse lowered nine times, raised four times; temperature lowered two times, raised six times; i.e., pulse lowered, temperature raised, sub-normal.

Case 11.—Mr. H. E., age 33; diagnosis, neurasthenia.

Date.	Pulse.		Temperature.	
	Before.	After.	Before.	After.
Mch. 7, 1893			98	98.4
" 27, "	85	84	98.4	99
" 28, "	92	84	97.3	98.2
" 30, "	92	84	98.4	98.8
April 4, "	100	92	99.2	99
" 5, "	80	84	98.3	98.4
" 10, "	88	84	98.3	98.6
" 11, "	112	92	98.2	98.7
" 12, "	88	92		
" 14, "	96	92		
" 15, "	92	84		
" 19, "	92	96		
" 25, "	100	88		
" 27, "	104	80		
" 29, "	96	100		
May 3, "	84	88	98.4	99
" 6, "	88	92	98	98
" 10, "	100	88	98.4	98.4
" 13, "	88	88	98	98
" 15, "	100	88	98.8	98.8
" 17, "	96	88		
" 19, "	84	84	98.4	not taken.
" 20, "	96	80	98.4	98.4
" 23, "	not taken.	80	98.4	99.1
" 25, "	100	88	98.2	98.7

Remarks.—Pulse lowered fifteen times, raised six times unaltered two times, total twenty-three times; temperature lowered two times, raised ten times; i.e., pulse lowered, temperature raised, sub-normal.

I have three observations on the effect of statical electrization on the excretion of urea. The analyses were made by Dr. Cleaves.

Case 1.—A. L.; occupation, physician; diagnosis, lithemia; treatment, Franklinic current, positive insulation; long percussive sparks to spine, hepatic region and entire general surface for ten minutes; spray fifteen minutes three times a week.

June 19, 1893. Examination of urine; color pale yellow, faintly acid, odor normal, sp. gr. 1020; total amount for 24 hours, ℥ xx; no albumen, no sugar; urea, gr. vij to f.℥; total urea for 24 hours, 140.

June 21, 1893. Color reddish yellow, reaction acid, odor normal, sp. gr. 1030, slight precipitate of uric acid; total amount of urine in 24 hours, ℥ xvj; urea, gr. 8¾ to f. ℥; total urea gr. in 24 hours, 138⅔.

June 23, 1893. Sp. gr. 1028; urea vj gr. to f. ℥; total amount in 24 hours, ℥ xlviij; total urea gr. in 24 hours, 288; increase from June 19 to June 23, 148; June 29, urea 8¾ to f. ℥; June 30, urea 8¼ to f. ℥. No medicine given.

Case 2.—Mrs. E. L., age 35; occupation, domestic duties; diagnosis, chronic articular rheumatism; treatment, Franklinic current positive insulation, spray fifteen minutes, long percussive sparks to all affected parts and to general surface for fifteen minutes.

July 27, 1893. Examination of urine; quantity, 24 hours, ℥ xxxij; color reddish yellow, odor normal, reaction acid, sp. gr. 1030. Doremus' urea test shows 13¾ gr. to f. ℥. Total urea gr. to ℥ xxxij, 440. Abundant precipitate of uric acid on standing in cold.

July 28, 1893. Urine color amber, odor normal, reaction acid, sp. gr. 1030; total amount for 24 hours, ℥ xxxij. Doremus' urea test, 19 gr. to f. ℥. Total urea in 24 hours, 608 gr. Increase in nitrogenous elimination in 24 hours, 168 gr. Uric acid greatly diminished. Before, bottom of bottle covered; to-day only here and there a crystal. Result obtained from two static treatments, and in less than 48 hours.

Case 5.—Mr. L. W., age 36; occupation, manufacturer; diagnosis, neurasthenia; treatment, Franklinic current positive insulation, long percussive sparks to entire spine and general surface ten minutes, spray fifteen minutes.

June 21, 1893. Urine examination. Color pale amber, reaction faintly acid, sp. gr. 1012; no albumen, no sugar; amount for 24 hours, ℥ lxiv; urea 5¾ gr. to ℥ j; total urea in 24 hours, 368 gr.

July 6, 1893. Color pale amber; no sediment; reaction faintly acid; sp. gr. 1025; no albumen, no sugar; urea 9¼ gr. to f. ℥ j. Total amount 24 hours, ℥ lx; total amount of urea 24 hours, 555 gr. Increase since June 21, to f. ℥ 3½ gr; total increase since June 21, 187 gr. No medicine given.

The second case was one of chronic articular rheumatism. If uric acid can be greatly diminished, and the urea correspondingly increased, that is much better than the introduction into the system of solvents of uric acid. As a result of two static treatments, the total quantity of urea for the twenty-four hours was increased about two hundred grains, and the uric acid greatly diminished.

Lastly, it must be noted that the patient gains in weight. I can recall one case in which a man gained forty-two pounds in five weeks.

My purpose, however, to-day is only to call attention to the fact that there is objective evidence that nutritional processes of the human organism are intensely affected by the statical form of electrization. I regard statical electrization as simply the beginning of a new era of electrization; in other words, a period when we can place the patient in the electro-static field and secure remarkable effects thereby. The day of the periodic current in medicine I think will come, and will give us better results than we have now. Much as I respect Duchenne's dictum about applying electricity locally, I believe we are approaching a period in which our treatments should be made so as to affect the whole system. General faradization or galvanization is a comparatively feeble method; it has nothing to do with the general treatment of which I am now speaking.

The mechanism which I published in 1881, is the very one which is found to-day to be essential for producing these electro-static effects—the static induced current and the mechanism for its production have really proved to be the key to this whole subject.

I am glad that now after many years I can give evidence for the faith that has been in me; can in fact give proof that statical electrization profoundly affects the nutritional mechanism in living tissue.

DISCUSSION.

DR. H. E. HAYD said he had been particularly interested in statical electricity, yet until now he had had but a faint idea of the manner in which he had obtained his results in practice. This form of electrization undoubtedly affects the secretions, for he had frequently observed that the specific gravity of the urine and the amount of the solids have increased. He knew the circulation must be influenced by statical electricity, because his patients had often returned to him with the statement that since the treatment they had had a feeling of stimulation, and their feet were no longer cold. For this reason, treatment had proved particularly beneficial in cases of neurasthenia.

It is also especially useful in muscular rheumatism, because it stimulates the hepatic function. He believed that all forms of rheumatism are largely due to hepatic trouble, and hence, the stimulation of the liver is an important element in the treatment. He had often observed a great increase in the body weight in those subjected to this treatment. As he had always been under the impression that the effect of the static spark was that of a stimulant, he was surprised to learn that the pulse was diminished. He had found the quantity of urea for the twenty-four hours increase from two hundred to four hundred grains.

DR. MASSEY referred to a recent case in which the improved nutrition was only explicable by the effect of the static charge. The case was one of lupus of the skin, occurring in a nurse. As a result of a month's treatment there was an increase in weight of ten pounds, and a very marked improvement in her general appearance.

DR. HERDMAN said he felt personally indebted to the author for the paper, and he hoped to have an opportunity to carefully study it at his leisure. He considered it one of the most valuable presentations on the subject he had heard.

The acceleration of the circulation in itself, it seemed to him, explained many things. As to the lowering of the pulse, the first effect on the circulation as the author said, was that of vaso-motor constriction, and the secondary effect, a dilatation. The vaso-motor dilatation would account for the perspiratory glands being excited to unusual activity. We also can explain in this way the favorable influence on nutrition observed in neurasthenic patients. He believed that neurasthenia was essentially an anemia, and by anemia he meant that parts which need blood can not get a sufficient supply of it. This may be the case in passive congestion, as well as in conditions where there is a lack of blood in the part. This being essentially the condition in the spine in neurasthenia, this statical electrization would necessarily stimulate the circulation. In spinal irritation and neurasthenia he had found as a matter of experience that the circulation of these parts is increased and the general nutrition secondarily improved. The nervous centers as a result of the increased and quickened circulation are restored to their original activity of function.

Only a few days ago, Tesla in his presence admitted that these high frequency ideas started from the Leyden jar

action, the action of the static machine and the oscillatory movement necessarily brought about by their high tension; hence, Morton's experiments were really the starting point of Tesla's astonishing experiments.

DR. WALKER wished to come before the faithful and acknowledge the error of his ways. Last year he stated that he attributed the results of statical electrization largely to mental suggestion. However, he went home and experimented further, and although his machine was one of those characterized by Dr. Morton "as only a toy," he had obtained very excellent results in the way of increased circulation. The patients observed increased warmth of the feet for one or two days after treatment. In rheumatic cases his success had been uniform, and the results were different from those he obtained by massage or other means.

DR. GREEN was sorry he could not say he was a convert, although he had investigated statical electricity for some years. The author had not shown a marked difference in the temperature although claiming a marked effect on the pulse; and he had given nosphygmographic tracings. The speaker said that that in 1887 he had the pleasure of watching some investigations in hypnotism in the McGill University. Here sphygmographic tracings were found to be different in the two wrists. The author had also criticized his statement about the effect of electricity being due to chemic action. The fact that there is an effect on secretion of urea, and that there is a change in temperature and an equalization of the circulation shows that there has been a chemic change. He has seen effects from the other currents he thought he could attribute to them, but had not had sufficient experience to lead him to feel that the results of statical electrization are not due largely to suggestion.

DR. SPRAGUE said he had been using the statical current in an empirical way, and was therefore glad to learn that this subject had been placed on a more scientific basis. He also had obtained good results with the so-called "toy" machines, in neurasthenic cases particularly. One girl received treatment on alternate days with a little static machine, and by this means was able to obtain refreshing sleep and continue at her school work. He did not yet understand why glass was better than ebonite in the machine. He was at present using a Gaiffe ebonite machine, and it gave better results than he had formerly obtained with one of Atkinson's glass plate machines.

DR. PLYM S. HAYES of Chicago, said that up to about ten years ago he was skeptical as to the actual utility of the static machine, but since then he had used it almost constantly, and he could verify most fully what had been said to-day in its favor. He was very thankful to Dr. Morton for his tables, showing the changes taking place in the system as a result of statical electrization.

One point of importance he thought had not been brought out, i. e., whether the cell proper is affected by the passage of the galvanic current through the tissues. Some hold that the galvanic current passes through the fluids surrounding the cells, and that the cells by their structure resist the passage of the current. With the high tension of statical electricity he believed that the current acted directly upon the cell contents.

DR. CLEAVES said she could confirm Dr. Morton's statements as to the nutritional effects of statical electrization. One feature had not been alluded to in the discussion, the relief of constipation of years standing by the use of the Franklinic current. Her method consists in making the applications to the reflex centers involved. She had also observed the remarkable increase in weight in a great many cases. In the cases reported in the paper, no medication was employed.

DR. MORTON, in closing the discussion, said he did not think Tesla yet fully realized that his original mechanism was the foundation of Tesla's remarkable experiments. If suggestion can produce a lowering or raising of a pulse, uniform in each case, and affect the urea in the manner described, then it would seem to be as good as electricity, and a method of treatment which might well be adopted instead of electrical treatment. Before accepting this statement, however, he would like to see some tables corresponding to those he had presented. He had himself followed hypnotism quite closely, but had found nothing in it comparable to the results which he had described. A continuous current can not pass through our tissues except by electrolytic conduction, and if this exists, there must be chemic decomposition, but these currents do not decompose the tissues they traverse.

He did not doubt that the machines he had dubbed "toy" machines produced many good effects, but he hoped there would be a more general adoption of the larger and more useful machines. There is much ozone and phosphoric acid formed during statical electrization, and these act upon the ebonite plates. Moreover, the ebonite has a tendency to become brittle after prolonged use.

He had not intended to touch upon the disease effects, and hence, had omitted to say anything upon the treatment of constipation by this form of electrical treatment.

(*To be continued.*)

Lancaster, Pa., Medical Society.—The December meeting of the Lancaster City and County Medical Society was held December 6. There was a large attendance of members.

Prof. H. A. Hare of Jefferson Medical College, read a paper on "The value of the hand and tongue in diagnosis of diseases, and the treatment." This paper was discussed by a number of the doctors.

The reports presented by the members showed influenza to be epidemic in the country, but it was stated that the disease is not as severe as in the past winters.

Mitchell District Medical Society, will meet in the city of Seymour, Ind., Dec. 28 and 29, 1893. An interesting and profitable program is expected. Geo. W. Burton, Secretary.

CORRESPONDENCE.

Women Kept Out of Salt Lake Medical Society.

SALT LAKE CITY, UTAH, Dec. 5, 1893.

To the Editor:—I have been a member of the AMERICAN MEDICAL ASSOCIATION for seven years I think; sponsored at my admission by Dr. Etheridge and Prof. W. S. Haines, my preceptors. I have paid my dues and appreciated the distinction of membership. When I came to Utah, almost six years ago, I was, so far as I was able to learn, the only member of the parent society in this Territory. The profession turned a cold shoulder to me, but I insisted upon thriving. In course of time, a well-meaning man presented my name to the local society for admission and I was turned down, one noble exponent of the art of medicine saying, "if I were admitted (he admitting that my claims to fellowship were beyond controversy), "all the d—— hags in town would want in"—he referred to the women practitioners among the Mormons. When this was reported to me, I said that they had Mormon men in their society; why not Mormon women who were graduates of a regular medical school (Philadelphia) and qualified practitioners? "Well, we need the men's money," they cried. But you get women's money just the same, I further claimed. But they did not abandon their very untenable position. When it developed that I belonged to the AMERICAN MEDICAL ASSOCIATION and had belonged to the Chicago Medical Society, it struck some men of the local society as very absurd, and they came to me personally to apologize, and said the people present at the meeting where I was refused admission were not representative, and would I apply again. Of course I refused. After this, this society sent one of its members East to attend a meeting of the ASSOCIATION as its representative. He was received and made chairman or vice-president, or something, from this Territory. Recently, another woman asked for membership in this society and was refused—because she was a woman, the answer to her application stated, and they did not admit women. Last year, I concluded to ask the AMERICAN MEDICAL ASSOCIATION why I should do my duty towards them when they did none towards me. I had already written to one officer of the ASSOCIATION, at the time it recognized this society, and I received no answer. So I wrote the President, and he advised me in his reply to go to Milwaukee in 1893 and lay my case, with "evidence," before the committee of grievance or other such functionary. Milwaukee is not immediately adjacent to my place of resi-

dence and the walking was not good last spring, so I did not go. I am again in receipt of my due bill to the AMERICAN MEDICAL ASSOCIATION. Last year, I concluded not to put up any more, but they drew on me through a bank and I paid up. Now, what I want to know is, What right has the AMERICAN MEDICAL ASSOCIATION to extend fellowship to societies which will not receive its members? Why should I put up five hard silver dollars every year* as my tribute of respect to a society which shows no respect for me? I am only one woman, way out in the repudiated silver district—but the ASSOCIATION owns lots of women on its list; and when it decided to admit women, it agreed to champion them. Now, membership in this society is of no manner of value to any one, for most of the best representatives have left it and formed another society, and its meetings and productions would be of no advantage to a tyro; but it is the principle I am after—if there is one to be found in the premises, and before I pay any more money to the AMERICAN MEDICAL ASSOCIATION I want to know what I am getting for it? Sincerely, ELLEN CURTIS GAGE, M.D.

*What is the matter with the JOURNAL, Dr. Gage?

Rush Medical College.

CHICAGO, Dec. 8, 1893.

To the Editor:—Kindly announce in the JOURNAL that the Faculty and Trustees of Rush Medical College have decided to introduce a resolution at the next meeting of the American Medical College Association that all students who begin their studies in 1895 with a view of graduating in 1899 will be required to attend four full courses of lectures in a medical college, of not less than six months each. Providing that graduates of universities and colleges which give a suitable scientific course may be admitted to the second year in the medical college, and also that graduates from schools of pharmacy that require three years of study and an adequate preliminary education, and graduates of dental schools requiring two years of study and adequate preliminary education will be admitted to the second year in the College. I am, yours very truly,

E. FLETCHER INGALS, Registrar.

BOOK NOTICES.

Surgery. By BERN B. GALLAUDET, M.D. Demonstrator of Anatomy and Clinical Lecturer on Surgery, College of Physicians and Surgeons, New York; Visiting Surgeon, Bellevue Hospital, New York; and CHARLES N. DIXON-JONES, M.D., Assistant Surgeon, Out-Patient Department Presbyterian Hospital, New York. Being the final volume of The Students' Quiz Series, edited by BERN B. GALLAUDET, M.D. Duodecimo, 291 pages, 149 illustrations. Cloth, $1.75. Philadelphia: Lea Brothers & Co. 1893.

This book is an extremely useful one of its class, much more complete than the ordinary quiz manual.

The author has sought to *explain* the surgical topics of the day in clear and concise terms, and has succeeded well. The style is rather dogmatic, but that could scarcely be avoided in a work so condensed.

A Manual of the Diseases of the Nervous System. By W. R. GOWERS, M.D., F.R.C.P., F.R.S. Consulting physician to University College Hospital; physician to the National Hospital for the paralyzed and epileptic. Second edition revised and enlarged. Vol. II. Diseases of the brain and cranial nerves, general and functional diseases of the nervous system, with 182 illustrations including a large number of figures. Philadelphia: P. Blakiston Son & Co. Chicago: The W. T. Keener Co. 1893. Price $4.50.

The first volume of this magnificent work was devoted to diseases of the spinal cord and nerves. There is therefore left for discussion in this volume the diseases of brain and cranial nervous system, and the thoroughness with which the subject has been considered, leaves nothing to be desired. Whoever in the next few years attempts to cover the same field, will have very hard work, either to present a new topic or to present it from a new standpoint, and even then the chances are more than equal, that the point will have been already better said in Gowers. No work could be more exhaustive within the limits of living issues, and few could be compressed into clearer or better English. There is no disconnection; there is continuity and system from title page to colophon. The paper is good and the illustrations are fair. The vast amount of material compressed into this volume has necessitated the use of small type, but not the sacrifice of typographical excellence.

Transactions Illinois State Medical Society.

This handsome volume of 528 pages contains the proceedings of the Forty-third Annual Meeting, which was held in Chicago; list of officers since the organization; list of members; announcement of committees for the current year; the papers read at the meeting with the discussions thereon; a full account of the society business for the year, and the annual necrology report.

Among the papers of historical interest we notice one by Dr. W. O. Ensign on "Medical Societies of the State." It appears from this report that the oldest medical society in the State was organized in 1846, and still exists as the "Esculapian Society of the Wabash Valley." The Chicago Medical Society was not organized until 1852.

President E. F. Ingals in his address takes strong ground in favor of a National Department of Public Health.

The papers as a rule are excellent, and reflect credit alike on the authors and the Society.

The Forty-fourth Annual Meeting will be held at Decatur May 15, 16 and 17, 1894, under the Presidency of Dr. Otho B. Will of Peoria. The society is in a flourishing condition, the membership list showing 595 active members.

Annual of the Universal Medical Sciences. A yearly report of the progress of the general sanitary sciences throughout the world. Edited by CHARLES E. SAJOUS, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators and correspondents. Illustrated with chromo-lithographs, engravings and maps. Vols. V. Philadelphia: 1893. The F. A. Davis Company.

The sixth issue of this great Annual is this year more distinctly inter-national than before. The temporary removal of the accomplished editor to Paris, has enabled him to secure more well known names on the list of active editors, such as Du Jardin-Beaumetz on cholera and epidemiology, Benjamin Ward Richardson and others.

As time has passed, the different compilers of this work have become more similar in style, so that the work as a whole is more uniform.

The fortunate possessor of this work is spared the necessity of subscribing for so many medical journals, as he finds a carefully prepared digest of the different branches of medical literature, ready to his hand, and in most instances the digest has been prepared by one who is himself an authority on the subject of which he treats.

MISCELLANY.

The College of Physicians and Surgeons of Richmond, Va., has a class of 111 students.

Saturday and Sunday Hospital Association.—St. Louis is to have a Saturday and Sunday Hospital Association, on the model of the London and New York Associations.

Dr. Joseph Price of Philadelphia, has proposed to tender his resignation as physician to the Preston Retreat, and the *Philadelphia Record* urges the appointment of a female physician to the prospective vacancy.

They Like the Mayor.—It is said that over two hundred physicians of Boston have signed a paper vouching for the purity and strength of Mayor Matthews' administration, and urging his reëlection.

Elizabeth Board of Health.—President John W. Whelan of the Elizabeth N. J. Board of Health is about to resign the position. His successor will be Dr. Victor Mravlag. Dr. Mravlag is the physician for the Pennsylvania Railroad Company and Surgeon of the Third New Jersey Regiment.

Dr. P. O. Hooper of Little Rock, Ark., retired from the Superintendency of the State Hospital for the Insane at that place, December 1. Dr. Hooper leaves an excellent record for efficiency, and carries with him the good wishes of many friends. Dr. J. J. Robertson has been appointed to succeed Dr. Hooper.

Woman's Medical College in Russia.—A new school of medicine for women has been started at St. Petersburg, to which the State contributes 15,000 roubles annually. The course at the school lasts four years, but students are expected to work from one to three years as well, in hospitals for women and children, before presenting themselves for the final examination.

The Present Epidemic of Influenza.—The sickness statistics of Michigan, according to Dr. Baker, Secretary, have demonstrated the law that, generally, influenza (la grippe) is quantitatively related to the atmospheric ozone—the more ozone the more influenza; and the law that remittent fever is inversely related—the more ozone the less remittent fever. The unusual amount of ozone, the increase of influenza and the falling off of remittent fever as shown in the State Board of Health Bulletin for the week ending November 18, illustrates these general laws.

An Over Crowded Asylum.—The Trustees of the Worcester, Mass., Lunatic Hospital, and the Worcester Insane Asylum have made respectively their sixty-first and sixteenth annual reports. The daily average of patients in the Hospital has been 878.78, the largest within the history of the Hospital. The wards of the Hospital are open to the students of Clark University. Weekly clinics have been held at the Hospital during the winter and spring months. Notwithstanding the enlargement of the buildings they are still overcrowded.

Smallpox in New Jersey.—At Elizabeth, N. J., a rather brisk epidemic of smallpox has occasioned an adjournment of the county court and an interruption of other forms of business. Four new cases were brought to light in a single day, and the local contagious disease hospital—a frame structure on the Newark meadows—is overcrowded. It will be necessary to construct temporary shelter for the patients that continue to come in. The Board of Health of the State has had representatives on the ground, for the purpose of checking the spread of the disease to other localities.

Painting of Ambroise Pare.—A movement is on foot to purchase for the Academy of Medicine, in West Forty-third Street, the celebrated picture of Louis Matont, entitled "Ambroise Paré," which belongs to a son of the late Dr. Nelson Place. It was painted in commemoration of the first ligation of arteries by the renowned French surgeon, and after an engraving of it had been made, it was purchased by Dr. Place, who was at the time in Paris. Among the gentlemen who have subscribed toward the fund for its purchase are Dr. D. B. St. John Roosa, Dr. Everett Herrick, Dr. J. West Roosevelt, Dr. W. K. Otis, Dr. E. L. Keyes, Dr. A. L. Loomis, Dr. Joseph D. Bryant and Dr. A. Jacobi.—*Mail and Express.*

Dr. William C. Hunt who for the last thirty years has been one of the Visiting Surgeons of the Pennsylvania Hospital has resigned, owing to his being incapacitated, in consequence of injuries received in two accidents. Dr. Hunt was connected with the Hospital for thirteen years before he was appointed Visiting Surgeon, as student and Interne making his whole service forty-three years. Before he received his injuries he was one of the best anatomists in the country, and a typical medical man. His resignation was accepted with regret, and resolutions were passed by the Hospital authorities expressive of their appreciation of his long and faithful services.

The British Medical Association.—The Association has an active committee on inebriety and legislation, at the head of which is the eminent physician, Dr. Norman Kerr. A circular has lately been issued advocating strenuous laws for the management of habitual inebriates. Three or more learned societies, numerous magistrates, chaplains and other persons interested in reformatory rescue and preventive work, have strongly advocated: 1, power to compulsorily seclude habitual drunkards in special curative institutions; 2, curative seclusion for poor diseased inebriates at the public charge; 3, a removal of the existing hindrances to the immediate reception into a retreat of an inebriate voluntarily applying for admission, involved in an appearance before two justices. "The Home Secretary having promised to receive a deputation and to introduce a bill into Parliament based on the suggestions of the departmental committee, I am instructed to earnestly appeal to all Christian ministers to petition or memorialize the Home Secretary or the House of Commons in favor of this amended legislation, so loudly called for in the interests of the helpless victims themselves, of their distressful wives and families, and of the general community."

Florida State Board of Health.—The State Board of Health of Florida, has issued a catalogue of the licensed physicians of that State. They number 541. Of these there are thirty-four "homeopathists" and nineteen "eclectics." Each judicial circuit has a medical examining board and there is also a "homeopathic" board. The following are the secretaries:

1. Dr. C. R. Oglesby, Pensacola; 2. Dr. G. W. Lamar, Quincy; 3. Dr. S. T. Overstreet, Madison; 4. Dr. J. L. Horsey, Fernandina; 5. Dr. G. E. Welch, Palatka; 6. Dr. M. Kennedy, Bartow; 7. Dr. F. H. Caldwell, Sanford.

"Homeopathic."—Dr. C. W. Johnson, Jacksonville.

The relation of the medical profession to the State Board of Health will be appreciated when it is borne in mind that neglect to report immediately any case of yellow fever, smallpox or cholera is punishable "by imprisonment not exceeding six months or by fine not exceeding one thousand dollars." There is no other State Board of Health that has the same legal power to secure prompt report of contagious diseases, thus greatly facilitating their prevention and spread. May this not have been one of the causes that enabled the Board to prevent the spread of yellow fever from two well established points during the season just passed.

It is to be hoped that when another catalogue of the licensed physicians is published, more details will be given.

The Health of New York State.—The bulletin of the State Board of Health for October shows that the reported mortality for the month has decreased from a daily average of 311 to one of 290. In the corresponding month last year about one hundred more deaths occurred. The death rate for cities and large villages was 18.50 to 1,000 of population, and in the rural parts of the State about 15.50, that of the entire State being about 18. The mortality in rural towns is much less than that of last month, and less than it was a year ago. The decrease applies equally to all parts of the State.

From the principal zymotic diseases, except from diarrheal diseases, which caused 861 less deaths than in September, there has been an increase in mortality. The autumn increase in typhoid fever, which was low last month, is greater than usual, fifty more deaths occurring than in last October; the increase has been in the maritime and Western districts. There were 185 more deaths from diphtheria than in September, and the increased prevalence over last year continues, being confined to the Southern and Central districts. Its prevalence is noted in Haverstraw, Delhi, Sandy Hill, Moreau and Ilion. There is a slight increase in scarlet fever, but it is less prevalent than last year. Measles and whooping-cough are decreasingly prevalent and cause few deaths. Smallpox is diminishing in New York and its neighborhood. The temperature for the month was a little above the average of fifty-two degrees.

New Hospitals.—Passaic, N. J., is to have a $50,000 hospital in the spring.

The Central Maine General Hospital at Lewiston, is to be enlarged.

The State of Wyoming will build a public hospital for miners.

Lord Aberdeen opened the new Victoria Hospital at Montreal December 2. It was built by Lord Mount Stephen and Sir Donald Smith at a cost of more than $1,000,000.

The Meriden (Ct.) Hospital has just come in possession of a very large collection of surgical instruments valued at $1,000 and a complete library of medical works, bequeathed by Dr. H. E. Way of Bristol, who died several months since. Dr. Way was son of the late Samuel Way, a former respected resident of Meriden, and his sister, Mrs. James Hall, still resides in the town. Although Dr. Way had been for many years a successful practitioner at Bristol, he never lost his feelings of affection for the place of his birth. The gift adds very materially to the equipment of the Hospital and is highly appreciated by the physicians and Matron Baumann. The Hospital also received on Thanksgiving day, through the kind generosity of Mr. and Mrs. John Gallivan, the Kensington Avenue florists, a very handsome lot of flowers, the beauty and fragrance of which were enjoyed alike by the matron and the patients.—*Meriden Journal.*

The Prudential Committee of the general hospital, New Haven, are about to establish a maternity hospital in connection with the main institution. Plans for the building are already prepared and it is expected that it will be ready for operation in the spring. The fund by which the hospital is to be established is being raised under the direction of Eli Whitney, Jr., who has already secured about one-half the money necessary. It is proposed to make the institution one of the best of its kind in America, and better than any at present in New England. The hospital is to be under the supervision of an obstetric specialist. The management of the Yale Medical school and that of the Connecticut Training school are interested in the proposed institution. Part of the hospital will be devoted to free beds.

New Rush College Laboratory.—Preceded by formal exercises, the doors of the new laboratory of Rush Medical College were thrown open to the students December 4. At 4 o'clock every seat in the big lecture-room of the old building was taken, and the late-comers were obliged to stand in the rear of the balcony. President Edward L. Holmes called the assemblage to order and briefly stated the object of the gathering.

This invocation was delivered by the Rev. Dr. John L. Withrow, pastor of the Third Presbyterian Church. Dr. Henry M. Lyman delivered the dedicatory address. He said he remembered how the first class of the Rush Medical College had met fifty years ago yesterday in a small wooden building opposite the Sherman House. In those days little was known of the science of medicine, but the art of medicine was old and well understood and practiced. The speaker referred to the fire of 1871, and to the good judgment of the trustees in erecting the college on its present site near the big hospital. From a small institution the college had extended gradually from year to year, until now it has outgrown its clothes. Now the trustees hold $200,000 worth of property. The new laboratory which was opened he declared was equal to that of the best medical colleges.

Drs. James H. Etheridge, Walter S. Haines, James Nevins Hyde, Nicholas Senn and John M. Dodson, then in succession made a few remarks.

President John M. Coulter of the Lake Forest University spoke next. He said that many of the present generation were wont to refer to their successes by pointing out that they had grasped their opportunities. He thought it to be the duty of this generation to prepare better opportunities for its successors.

The new laboratory is located on the south side of Harrison Street, opposite the old Rush Medical College. It is a five-story and basement structure with a massive stone front and cost $95,000. In its interior it is modeled after the most improved plans. The rooms are used for the following branches of work:

First floor, physiology; second floor, histology; third floor, chemistry; fourth floor, materia medica; fifth floor, dissecting-room.

Adjoining the dissecting-room there is a large demonstrator's room.

Funds for the erection of the new building were subscribed from the private purses of the members of the Faculty, and the Faculty waived any claim to compensation for their services for the last year.

The Brunswick Yellow Fever Relief Fund.—The Yellow Fever Relief Committee adopted the following resolutions November 30, with the request that they be published by the press:

"The expenditures for charity, to those familiar with the circumstances surrounding our people before and during the epidemic, need no explanation. More could have been wisely expended had the treasury authorized it. The expenditures of the commissary, beyond the distribution of supplies sent by a generous public, were largely to purchase supplies of which the commissary ran short, and in the purchase of stimulants for the sick and special food for the convalescent.

"The city treasury, due to bank failures and other causes, was empty. The large expenditures for police sanitation and special sanitation, made necessary by hurricane and flood, have fallen upon this committee as the only organized body which could attend to these matters. It was thought wise to keep as many male adults, who must necessarily be fed, at work as possible, thus keeping them out of mischief, and creating the feeling that they were earning the food and money received. Every effort has been made through the preachers of this city, the members of the committee, and special canvassers to investigate carefully and distribute rations, money, and clothing to the needy, no matter what their circumstances under ordinary conditions had been.

"Confronted by the said conditions of the past three months, we have dealt with them as best we could, meeting emergencies as they arose. Funds have been practically exhausted, at times with rations on hand to last but three days. Counting upon the generosity of the American people, we have purchased supplies on credit, and our trust has been sustained, for funds and provisions came. The circle of those needing aid widened daily during the first days of the epidemic. Those on the islands and in the country have been considered within the range where assistance should be rendered when needed, and over six thousand people have received assistance.

"When, upon the partial subsidence of the epidemic, careful investigation of our supplies and funds indicated that we could pull through, thankful to a generous public, which, in times of great general distress, had come to our aid, we announced that, with donations already en route, we would ask no further aid—that we desired no surplus, and would trust the future to bring us business and place the people in a position to help themselves.

"To the railroad and other transportation officers, to a great and generous public, to the public press of the country, and to each and every other agency and individual contributing to relieve the distress of the people shut in here as a besieged city, we tender our heartfelt thanks.

"THOMAS W. LAMB, President and Mayor."

"L. C. BODET, Secretary.

THE PUBLIC SERVICE.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from December 2, 1893, to December 8, 1893.

First Lieut. CHARLES WILLCOX, Asst. Surgeon, will be relieved from temporary duty at Angel Island, Cal., on the arrival there of Major BENJAMIN F. POPE, Surgeon, and will report in person to the commanding officer, Boise Bks., Idaho.

Col. CHARLES PAGE, Asst. Surgeon General, retirement from active service this date, Dec. 4, 1893, by operation of law, under the provisions of the Act of Congress approved June 30, 1882, is announced. By direction of the President.

First Lieut. FRANCIS A. WINTER, Asst. Surgeon U. S. A., is relieved from further duty at Ft. Wingate, N. M., and from temporary duty at Ft. Bayard, N. M., and will proceed to New Ft. Bliss, Texas, and report in person to the commanding officer for duty at that station.

LETTERS RECEIVED.

(**A**) Ayres, D., Ft. Plain, N. Y.; Allen, E. P., Athens, Pa.; (**B**) Burnett, C. H., Philadelphia, Pa.; Brown, C. F., St. Peter, Minn.; Beck, G., Bern, Switzerland; Bacon, C. S., Chicago, Ill.; (**C**) Cleaves, Dr. M. A., New York City, N. Y.; Chase, R. H., Frankford, Philadelphia, Pa.; Carter, R. H., Waco, Tenn.; (**D**) Davidson, S. S., Mercer, Pa.; Dougan, W. McKay, Otoe, Oklahoma; Dunglison, R. J., Philadelphia, Pa.; (**E**) Eastman, C. A., Hudson, Mass.; Edwards, Wm. M., Kalamazoo, Mich.; (**F**) Fletcher, C. A., Kalamazoo, Mich.; Flint, A., New York, N. Y.; (**G**) Gores, F. C., Cincinnati, Ohio; (**G**) Gould, Geo. M., Philadelphia; (**H**) Heath, F. C., Indianapolis; Hofheimer, Dr. J. A., NewYork City; (**J**) Johnson, C. J., San Francisco; (**K**) Khuginsmith, J. P., Blairville, Pa; (**L**) Lydston, J. A., Chicago, Ill.; (**M**) Motter, D. M. G., Lancaster, Pa.; McKibben, A. L., Green Garden, Pa.; Morrison, W. H., Holmesburg, Pa.; (**O**) O'Connor, F. B. Jr., Brooklyn, N. Y.; Osler, Wm., Baltimore, Md.; (**P**) Pepper, Wm., Philadelphia; Parsons, F. S. Philadelphia; Perpœna Chemical Co., New York, N. Y.; (**R**) Ricketts, B. Merrill, Cincinnati, Ohio; Ruggles-Gale Co., Columbus, Ohio; Rebman, F. J., London, Eng.; (**S**) Starr, F. N. G. Toronto, Can.; Steiner, D. W., Lima, Ohio; (**T**) Tiffany, Flavel B., Kansas City, Mo.; (**W**) Watkins, P. L., New York, N. Y.; Williams, D. A., Franklin, Ohio.